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TO: Interested Citizens and Public Agencies DATE: April 14, 1986

FROM: General Manager

SUBJECT: Draft 1986 BART Five-Year Plan

NELLO BIANCO
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KEITH BERNARD
GENERAL MANAGER

Draft Bay Area Rapid Transit Plan, 1986-1991

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I am transmitting the attached copy of BART's draft 1986 Five-Year Plan for your review and comment prior to adoption and publication of the final version of the document in June.

The plan contains an evaluation of progress toward current objectives and other issues affecting provision of future service levels. Draft operating objectives for FY 86/87 and the remaining period are presented, together with the updated Capacity Expansion Program, and the associated financial plan, including five-year operating and capital budgets.

Based on the updated patronage projections and other related factors, this document confirms the need for the District's previously planned Capacity Expansion Program. For over two years, ridership growth in the peak period/peak direction has been curtailed by the lack of additional capacity. Anticipated peak period/peak direction ridership growth is projected to follow service expansion and access improvement, and is expected to require that all additional revenue vehicles now in production be utilized for service by 1991.

In contrast, ridership growth for the balance of operations, as indicated by patronage since mid-1985, is less than previously experienced and forecast last year through 1990. Future patronage projections have therefore been reduced with consequent effect on passenger revenue estimates. Operating expense projections are generally within the previous forecast. However, financial assistance projections have been revised downward in line with recent experience and projected lower economic growth rates. As a result, significant operating deficits are forecast for the last four years of the planning period.

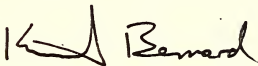
Draft 1986 BART Five-Year Plan

April 14, 1986

Page 2

Operating revenues and financial assistance virtually equal expenses in the proposed budget for FY 86/87. Thus, the District has a year to begin to resolve the longer-run financial problems anticipated in this plan. However, the five-year operating budget projections do not include the effects of two proposals now being considered: extra station agents that may be required by court action, and a higher level of feeder bus service support contemplated by the AB 842 transit financial planning process.

Written comments are requested by Friday May 16, 1986. An opportunity for public comment on the draft plan will occur during the BART Board meeting at 9:00 A.M., Thursday, May 29, 1986. Copies of the draft plan will also be available for review at local public libraries throughout the three-county District.

A handwritten signature in black ink, appearing to read "Keith Bernard". The signature is stylized with a large, sweeping initial "K" and a cursive "Bernard".

Keith Bernard
General Manager

cc: Board of Directors
Department Heads

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DRAFT

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BAY AREA RAPID TRANSIT DISTRICT
FIVE YEAR PLAN

FOR THE PERIOD JULY 1986 THROUGH JUNE 1991

The preparation of this report has been financed in part through a grant from the United States Department of Transportation, Urban Mass Transportation Administration under the Urban Mass Transportation Act of 1964, as amended, as passed through the Metropolitan Transportation Commission.

The contents of this report reflect the views of BART, which is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the original views or policy of the U.S. Department of Transportation. This report does not constitute a standard, specification, or regulation.

April 1, 1986

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SUMMARY

The 1986 draft update of the BART Five-Year Plan follows the format utilized in previous plans: Chapter I reviews key planning issues, chief among which is the re-evaluation of projected ridership growth; Chapter II documents the operations and capital improvement program, including the draft FY 86/87 operating performance objectives; and Chapter III presents the District's five-year financial plan, including both operating and capital projections.

For several years, the main emphasis of the Five-Year Plan has been on expanding peak period capacity in the corridors BART serves. (A summary of this program is shown in Figure 4, page S-9.) This effort is based on the need to transport more commuters and other peak period riders, and on the opportunity to increase BART peak period capacity significantly without proportionate increases in capital facilities cost. Chapter I presents a reassessment of ridership growth in response to previously planned service increments. The need for the planned expansion program is confirmed. Given the projected ridership growth in the peak period/peak direction, all additional revenue vehicles now in production are expected to be required for service by 1991.

A notable finding of the patronage growth analysis is that the rate of increase in BART ridership since mid-1985 is less than previously experienced and forecast last year for the period through 1990. Peak hour/peak direction patronage has not grown appreciably during the last two years, as anticipated, because load factors are high and no additional vehicles have been available for service since 1983. Peak hour travel is expected to grow as new service is added. However, ridership growth for the balance of the peak period during which capacity constraint is not as severe has dropped below previous rates.

This moderating of growth rates for those trips which do not pass through the peak load points is reflected in the updated patronage forecast. Therefore, ridership and resulting passenger revenue projections are somewhat less than previously estimated. This has significant budget consequences as noted below.

District performance in terms of FY 1985/86 objectives is reviewed in Chapter II, as a basis for establishing detailed objectives for FY 1986/87 as well as more general objectives through FY 1990/91. As this analysis indicates, District performance in terms of several key service indicators has not matched planned objective levels.

Part of this less than desired performance since mid-1985 is attributed to work on two capacity expansion projects: the KE Track and the Daly City Turnback. Completion of the former in December 1985 eliminated its negative impact on on-time performance. However, because of the apparent effect of service quality on ridership, every effort will have to be taken to minimize the future service impacts of capacity expansion project construction and integration.

The financial dimensions of the updated operating plan developed in Chapters I and II are summarized in Chapter III. Future operating expense estimates are somewhat lower than forecast last year. However, even lower passenger revenue and financial assistance projections result in unfunded

operating deficits of \$7 to \$14 million. If actual ridership growth and increases in financial assistance do not exceed current projections, there will be a pressing need for both operating cost efficiencies and possible further revenue enhancements.

District policy as reflected in BART goals and objectives is summarized in figures 1, 2, and 3 starting on page S-3. The operating and capital financial requirements needed to support the five-year plan are summarized in Figures 5, 6, and 7 beginning on page S-10.

FIGURE 1
BART GOALS FOR FY 1986/87

1. Operate scheduled 4-route weekday service with route headways of 15 minutes or less during peak and midday periods and expand service within feasible, technical, and financial limits including improved peak-hour frequency of service and capacity where needed.
2. Improve the reliability performance of the present BART system.
3. Continue to improve BART system and patron safety and emergency preparedness.
4. Increase system utilization by promoting BART travel for all purposes with special emphasis on offpeak and reverse commute trips.
5. Fund and implement the necessary capital improvements and replacements to the system.
6. Operate within available funds without incurring an unfunded deficit.
7. Maximize the contribution to operating costs from passenger revenues, consistent with reasonable fare levels, to achieve a farebox ratio above 50%.
8. Make every effort to achieve District objectives for female and minority employment and minority business enterprise participation.
9. Improve system access by means of a comprehensive program of parking expansion, BART feeder services, transit coordination, and special projects addressing elderly and handicapped mobility.
10. Develop station area sites for the realization of increased patronage and revenues, and to enhance the communities BART serves.
11. Extend BART trunk lines within Bay Area travel corridors where feasible and in support of regional land use policies.

FIGURE 2: BART PERFORMANCE OBJECTIVES FOR FY 1986/87

BASIC SYSTEM SERVICE AND CAPACITY

1. Balance capacity where possible such that load factors for peak period trains which can be lengthened or shortened (consists between 3 and 10 cars) are relatively equal and provide offpeak service such that no train load factor exceeds 1.05.
2. Operate weekday peak period Transbay service in the peak direction providing at least 98.0% of scheduled train throughput and 97.5% of scheduled car throughput on a monthly average basis.
3. Until December 31, 1986, make available 102 A-cars and 261 B-cars for revenue service by 4 AM (weekdays); thereafter, make available 106 A-cars and 270 B-cars.
4. Increase peak period capacity from 43 trains to 45 trains by adding one train each to the two most heavily travelled routes (Fremont/Daly City and Concord/Daly City) by January 1987.

RELIABILITY

1. Complete 99% of all scheduled dispatches.
2. Conduct operations such that 95% of daily terminal-to-terminal runs are completed within 5 minutes of scheduled run times with at least 93% during AM and PM peak periods for commute days.
3. Provide service such that no more than 2% of peak period trains experience a primary delay exceeding 7 minutes and no more than 6% experience a delay from any cause exceeding 7 minutes.
4. Conduct operations such that 94% of all patron trips are completed on-time. All patron trips are on-time when trains run not more than 5 minutes late or 60 seconds early.
5. Provide service such that passenger offload rates remain at or below the following: vehicle equipment = 1.10; wayside equipment = 0.10; operations and other = 0.80; and the total = 2.00 (per 1,000 car hours).
6. Maintain the overall AFC technician maintenance incident rate at or below 0.30 incidents per 1,000 passenger trips, and maintain or exceed a 6 AM average weekday availability rate of 95% for entry/exit gates and 90% for ticket vendors.
7. Maintain a 6 AM average weekday availability of 95% for elevators and 93% for escalators.
8. Maintain express bus on-time performance such that 95% of all runs arrive at their final destination within 5 minutes of schedule.

FIGURE 2: BART PERFORMANCE OBJECTIVES FOR FY 1986/87 Cont'd.

SAFETY AND SECURITY

1. Provide sufficient police coverage such that the rate of patron-related crimes does not exceed ____ per million passengers for disorderly conduct and ____ per million for all others. (Under discussion by E & O.)
2. Continue to provide an environment for patron circulation through trains and stations such that the accident rate does not exceed 17.7 per million passengers.
3. Reduce the total annual amount of employee lost time due to injuries as a percent of time worked to 0.50% or less.
4. Conduct a minimum of one emergency plan exercise per month involving emergency response agencies.

PATRONAGE AND TRAVEL PROMOTION

1. At a minimum, achieve normal growth projections for average daily patronage as follows (in 1,000's):

	<u>Jul-Sep</u>	<u>Oct-Dec</u>	<u>Jan-Mar</u>	<u>Apr-Jun</u>	<u>FY 86/87</u>
Average Weekday:					
4-hour Peak:					(TO BE UPDATED PER FY 86/87 BUDGET)
Offpeak:					
Saturday:					
Sunday:					

2. In addition to the above, actively promote offpeak ridership to achieve a 3% increase in travel as follows (1,000's).

	<u>Jul-Sep</u>	<u>Oct-Dec</u>	<u>Jan-Mar</u>	<u>Apr-Jun</u>	<u>FY 86/87</u>
Weekday:					
Saturday:					(TO BE UPDATED PER FY 86/87 BUDGET)
Sunday:					

3. Continue sampling procedure to evaluate train and station area cleanliness, and maintain train and station cleanliness at or above an evaluation rating of 90%.
4. Continue concern for customer relations among public contact personnel such that the rate of patron complaints about this issue remains below 8.75 per million trips.
5. Continue public announcement procedures and practices such that the rating for four categories of announcements in the Passenger Services Sampling Survey averages at least 95%.
6. Complete installation of prototype passenger information panels at 12th Street/City Center Station.
7. Begin Regional Transit Association (RTA) passenger information panels project at BART stations.
8. In addition to existing bank ticket outlets, increase tickets-to-go outlets to 125 by June 1987.

FIGURE 2: BART PERFORMANCE OBJECTIVES FOR FY 1986/87 Cont'd.

FINANCIAL AND OPERATIONAL EFFICIENCY

(BLANKS TO BE UPDATED PER ADOPTED BUDGET)

1. Maintain a funded budget and farebox ratio of no less than ____% for BART express bus operations and ____% for rail operations.
2. Maintain a rail cost per passenger mile of ____¢ or less.
3. Achieve a level of service output such that ____ vehicle miles are produced per equivalent District employee (based on 2,000 hours worked, including overtime and excluding capitalized labor).
4. Improve system utilization (passenger miles per seat mile) to ____% through continued monitoring of train capacity to match passenger demand patterns.
5. Maintain a paid sick leave rate of no more than 3.5% (9.1 paid days) annually per employee.
6. Transmit key performance reports to the Board of Directors, Department Managers, and/or other recipients within the following number of working days after the close of each reporting period: Monthly Patronage Report (10), Monthly Budget Performance Report and Quarterly Affirmative Action Report (15), Quarterly Financial Statements (25), Quarterly Performance Report on System Objectives (35), Quarterly Operations Performance Report (45), and the Annual Report (75).

AFFIRMATIVE ACTION

1. Complete an evaluation of District performance in relationship to the 1983/86 Affirmative Action Plan objectives for women and minorities, and develop an updated plan by December 31, 1986 to cover a five-year period.
2. Work to achieve workforce representation objectives for women and minorities in accordance with the 1983/86 plan until the update is completed, and, thereafter, in accordance with the updated Affirmative Action Plan.
3. Work to achieve 21% minority business enterprise participation for all District contracts determined to have MBE opportunities, with 18% DBE and 3% WBE participation for federally assisted contracts.
4. Work to achieve not less than 15% equity participation in District Joint Development Projects by women and minority individuals and/or business enterprises.

FIGURE 2: BART PERFORMANCE OBJECTIVES FOR FY 1986/87 Cont'd.

SYSTEM ACCESS

1. Provide 2,955 BART-owned parking spaces at existing rail stations and planned future station sites.
2. Seek to acquire land required for surface parking projects on Bond listing projects.
3. Continue to implement schedule coordination between BART and AC Transit.
4. Implement first stage streamlining in the West Corridor.
5. Implement Express Bus/Rail ticket.
6. Implement AC/BART joint ticket.
7. Initiate installation of Phase II of the elevator improvements.
8. Complete evaluation of platform edge project and seek funds for systemwide installation if appropriate.

JOINT DEVELOPMENT

1. Complete station area plans at Fremont and Concord.
2. Assuming local government interest and cooperation, initiate station area planning at two of the following stations:

El Cerrito Plaza	Orinda	Union City
El Cerrito del Norte	Lafayette	Coliseum
Hayward		
3. Continue "anchor tenant" and master developer marketing efforts focusing on Pleasant Hill, Concord, and Lake Merritt.
4. Assuming favorable market conditions, negotiate an acceptable ground lease agreement at at least one of the above sites.
5. Negotiate an acceptable special entrance agreement for the Fifth and Market project at Powell Street.
6. Seek to develop additional special entrances.

EXTENSION SERVICE AND CAPACITY

1. Assist the Metropolitan Transportation Commission and SCCTD in completing the Preliminary Draft Alternatives Analysis/Draft Environmental Impact Document for the Fremont-South Bay Corridor by June 30, 1987.
2. Pursue acquisition of all sites as identified in the Extension Right-of-Way and Facilities Expenditures program within available funding by June 30, 1987.
3. Complete the Preliminary Draft Alternatives Analysis/Draft Environmental Impact Document for the Pittsburg-Antioch Corridor by June 30, 1987.

Figure 3: BART PERFORMANCE OBJECTIVES FOR FY 1987/88 THROUGH 1990/91

(Table to be provided in Final, see individual program areas in Chapter II for these objectives)

BART CAPACITY EXPANSION PROGRAM

3/21/86

MINIMUM HEADWAY CAPABILITY (MIN:SEC)	PROJECTS REQUIRED TO ACHIEVE OR SUPPORT THIS HEADWAY	ANTICIPATED PROJECT COMPLETION DATES	TARGET EXPANDED SERVICE START DATES	PEAK HOUR TRAINS PEAK DIRECTION TRANSBAY	PEAK PERIOD CAPACITY ON-LINE TRAINS	SPARE CARS	TOTAL CARS REQUIRED	AVAILABLE FLEET A/C-CARS 88% B-CARS 990% (EXTRA)	OPERATING FLEET SIZE
3:45	CURRENT SERVICE	---	JUL 80	16	43	A 86 B 235 T 321	102 259 361	108 (+6) 261 (+2) 369 (+8)	128 290 4180
3:30	KE TRACK	MAR 86	1)						
	FIRE HARDENING (CARS COMPLETED)	OCT 86	JAN 87	17	45	A 90 B 246 T 356E	106 270 376	114 (+8) 270 384 (+8)	135 300 435F
	DELIVERY OF 48 C-CARS	SEP 87	2)	17	48	A 96 B 41 C 246 T 583G	112 41 270 423	114 (+2) 41 270 425 (+2)	135 48 300 483F
3:10	FIRE HARDENING (REMOVAL OF VENT SEPARATION)	OCT 87	3)						
	ICS	OCT 87							
	DAILY CITY TURNBACK	DEC 87							
	ELECT. CAPACITY INCREASE: INSTALL 3RD RAIL & YARD FEEDER	APR 88				A 108 B 92H C 246H T 4461	114 119 270 503	114 128 (+9) 270 512 (+9)	135 150 300 585F
	DELIVERY OF 102 ADDITIONAL C-CARS (150-TOTAL)	SEP 88	JAN 89	19	54H				
2:30	DAILY CITY YARD	MAR 88	4)						
	NEW ON-BOARD ATC (A-CAR RETROFIT)	JUL 88							
	M-87 INTERLOCKING	JUL 88							
	ELECT. CAPACITY INCREASE: PROCURE & INSTALL SUB-STATION	MAR 89				A 114 B 90 C 246 T 450J	114 128 270 512	114 128 270 512	135 150 300 585F
	WAYSIDE TRAIN CONTROL/SYSTEM PERFORMANCE MODS	JUL 89	SEP 89	24	57				
2:15	BRAKE MODIFICATIONS	TBD	5) TBD	26					

- d Status as of December 1985.
- e With completion of firehardening, add 15 cars on-line (4 A's, 11 B's); 2 new consists (1-10 & 1-5).
- f Assumes 3 B's and 1 A on average will not be in operating fleet while awaiting repair of accident damage.
- g With first set of C-Cars, add 47 cars on-line (41 C's, 6 A's); 26 cars on 3 new consists (2-10's & 1-6) plus 21 cars to other trains.
- h Includes 2 extra 10-car trains required for operation of Daly City Turnback (prior to system resignaling) which do not increase actual capacity during regular peak cycle.
- i 3:10 headway permits addition of 6 consists (5-10's & 1-5) and 8 cars to other consists; 63 cars on new and existing consists (including 2-10's required for Daly City Turnback) plus 17 cars to spares.
- j 2:30 headway permits increase of on-line capacity of 5 consists; 25 additional cars on-line (note: requires further increase in spares of 5 vehicles and assumes requirement for 2 trains in Daly City Turnback is offset through resignaling).

3/21/86

3/31/86 wdb c:86opsum

FIGURE 5
SUMMARY FIVE-YEAR OPERATING BUDGET PROJECTIONS

	Budgeted 1986/87 *****	Projected 1987/88 *****	Projected 1988/89 *****	Projected 1989/90 *****	Projected 1990/91 *****
REVENUES					
Net Rail Passenger Revenue	\$83,111	\$86,191	\$95,372	\$104,882	\$109,552
Express Bus Revenue	1,099	1,453	1,970	2,060	2,122
Net Passenger Revenue	84,210	87,644	97,342	106,942	111,674
Other Operating Revenue	7,831	7,307	6,788	6,587	6,186
Net Operating Revenues	\$92,040	\$94,951	\$104,130	\$113,529	\$117,860
EXPENSES					
Net Labor	113,854	121,516	131,589	142,416	150,655
Electric Power	22,101	26,768	30,145	34,924	37,996
Purchased Transportation	14,100	14,805	15,546	16,323	17,139
Other Nonlabor	23,045	24,380	25,910	27,851	29,364
Total Operating Expenses	\$173,099	\$187,469	\$203,189	\$221,514	\$235,153
OPERATING DEFICIT	(81,059)	(92,518)	(99,059)	(107,985)	(117,293)
FINANCIAL ASSISTANCE					
Property Tax Revenues	6,750	7,155	7,584	8,039	8,522
Sales Tax Revenues	88,856	94,187	99,839	105,829	112,179
TDA	548	398	422	447	474
STA, Other State Funds	2,899	2,421	2,566	2,720	2,883
Debt Service Allocations	(13,800)	(13,800)	(15,700)	(15,750)	(15,850)
Capital and Other Allocations	(4,505)	(4,594)	(4,730)	(4,906)	(5,087)
Total Financial Assistance	\$80,748	\$85,767	\$89,980	\$96,379	\$103,121
NET FINANCIAL RESULT	(311)	(6,750)	(9,079)	(11,606)	(14,172)
FINANCIAL INDICATORS					
Annual Patronage	60,423	62,616	63,797	66,248	69,191
Annual Passenger Miles	774,616	802,737	817,878	849,299	887,029
Fare Box Ratio: Total, Rail Only	52.3%	49.9%	50.8%	51.1%	50.3%
Operating Ratio	53.2%	50.6%	51.2%	51.3%	50.1%
Rail Cost Per Passenger Mile	\$0.205	\$0.215	\$0.229	\$0.242	\$0.246
CAPITAL ALLOCATIONS					
Revenue Bond Debt Service	12,600	12,600	14,500	14,550	14,650
Sales Tax Anticipation Note Debt Service	1,200	1,200	1,200	1,200	1,200
Improvement Allowance	3,100	3,200	3,300	3,400	3,500
Planning	668	697	744	785	830
Joint Development	737	697	687	721	757
Total Capital Allocations	(18,305)	(18,394)	(20,430)	(20,656)	(20,937)

Figure 6

FIVE-YEAR CAPITAL PROGRAM SUMMARY

Expenditures, Cash Flow Basis
(000)

	Prior* Years	Budgeted FY 86/87	Projected FY 87/88	Projected FY 88/89	Projected FY 89/90	Projected FY 90/91	Projected Within 5 Year	5-Year Total
Vehicle Funded Unfunded	40,563 0	59,049 0	179,516 35,709	4,756 3,800	0 0	0 0	0 0	283,884 39,509
Facilities, Mainline Funded Unfunded	83,431 22,071	10,447 75,645	20,700 60,595	0 10,327	0 734	0 735	0 10,738	114,578 180,845
Facilities, Station & Access Funded Unfunded	7,532 524	52,685 4,656	15,402 6,783	14,178 27,376	10,949 49,346	83 35,009	735 568	102,311 124,262
Facilities, Support Funded Unfunded	188 0	641 0	0 839	0 0	0 0	0 0	0 0	829 839
Train Control Funded Unfunded	27,127 0	13,258 249	2,081 4,738	0 3,291	0 232	0 0	195 0	42,661 8,510
AFC & Communication Funded Unfunded	14,499 0	4,560 0	1,206 0	1,443 286	0 0	0 0	15 0	21,723 286
Electrification Funded Unfunded	919 0	533 3,627	186 4,084	0 1,187	0 0	0 0	70 340	1,708 9,238
Procurements Funded Unfunded	7,104 200	1,732 734	363 4,521	0 370	0 200	0 0	0 0	9,199 6,025
Other Categories Funded Unfunded	12,418 833	14,825 417	20,961 0	8,931 0	10,770 0	16,895 0	0 0	84,800 1,250
ALL CATEGORIES Funded Unfunded	193,781 23,628	157,730 85,328	240,415 117,269	29,308 46,637	21,719 50,512	17,725 35,744	1,015 11,646	661,693 370,764
GRAND TOTAL	217,409	243,058	357,684	75,945	72,231	53,469	12,661	1,032,457

* Prior Years Expenditures on Active Projects

Figure 7

FIVE-YEAR CAPITAL PROGRAM SUMMARY

Sources, Cash Flow Basis

(000)

	Prior* Years	Budgeted FY 86/87	Projected FY 87/88	Projected FY 88/89	Projected FY 89/90	Projected FY 90/91	Projected Within 5 Year	5-Year Total
UMTA Funds Funded	108,698	57,283	53,800	4,405	0	0	168	224,354
Unfunded	234,483	78,091	100,037	40,262	42,490	29,539	8,658	322,560
State Funds Funded	26,215	19,520	17,207	0	0	0	0	62,962
Unfunded	0	527	3,293	188	0	0	54	4,062
Regional Funds Funded	11,261	6,634	8,668	2,126	0	0	2	28,691
Unfunded	145	6,365	13,748	6,080	7,933	6,116	2,782	43,169
BARTD Funds Funded	47,607	74,293	160,740	22,777	21,719	17,725	845	345,706
Unfunded	0	345	191	107	89	89	152	973
ALL SOURCES Funded	193,781	157,730	240,415	29,308	21,719	17,725	1,015	661,693
Unfunded	23,628	85,328	117,269	46,637	50,512	35,744	11,646	370,764
GRAND TOTAL	217,409	243,058	357,684	75,945	72,231	53,469	12,661	1,032,457

* Prior Years Expenditures on Active Projects

I N T R O D U C T I O N

BART BACKGROUND AND PURPOSE OF SRTP

The BART District was formed in 1957 by the State Legislature in response to Bay Area growth forecasts and related future transportation needs. Following the major construction program, initial revenue operations, starting in September 1972, brought to light a variety of unanticipated problems. Over the past several years, intensive efforts have been directed toward improving reliability, service quality and capacity. This process has produced a greater understanding of the system's problems, together with "fixes" which have significantly improved train service.

BART's five-year plan presents a strategy for continued progress towards achieving a greater share of the system's full potential through increased capacity and improved system performance. The plan is the result of an ongoing process involving the District Board of Directors and management for the purpose of identifying future capital and financial requirements.

The document is divided into three chapters. The first identifies key issues and assumptions either carried over from the previous planning cycle or those which have more recently emerged. These concerns are then incorporated into the performance evaluation and planned improvements portion of the plan which is presented in Chapter II. The District's policy framework, consisting of annually adopted program area objectives, provides the framework for this discussion. Chapter III then presents the District's financial plan for supporting the capital and operating improvements identified in the previous chapter.

DISTRICT ORGANIZATIONAL OVERVIEW

Current BART organization reflects a management structure which has evolved over the past 11 years to carry out District programs and policies (see Figure i-1 on page ii). Fourteen department managers report directly to the General Manager who in turn reports to a nine-member elected Board. As Board appointed officers, three of the department managers also report directly to the Board of Directors. These are the General Counsel, Controller/Treasurer, and District Secretary.

As the legislative body of the District, the Board of Directors establishes BART policy. Each year the Board of Directors reviews and adopts a set of goals and program area performance objectives reflecting District needs. The goals are presented in Figure i-2 on page iii. This process is part of the annual budget and five-year planning cycle, and serves to guide management in budgeting for and organizing BART's labor force (consisting of approximately 2,200 employees) so that desired levels of performance may be achieved. Additionally, progress towards implementing important programs and capital improvements is continually monitored and reviewed. Other projects continue to be identified as part of this process in an effort to improve BART's effectiveness and operating performance even further. The Project Review Board, composed of key department managers, plays an important role in this process by recommending to the General Manager project priorities based on staff analysis and evaluation of District needs.

TABLE i-I

(To be provided in final)

FIGURE i-2

BART GOALS FOR FY 1986/87

1. Operate scheduled 4-route weekday service with route headways of 15 minutes or less during peak and midday periods and expand service within feasible, technical, and financial limits including improved peak-hour frequency of service and capacity where needed.
2. Improve the reliability performance of the present BART system.
3. Continue to improve BART system and patron safety and emergency preparedness.
4. Increase system utilization by promoting BART travel for all purposes with special emphasis on offpeak and reverse commute trips.
5. Fund and implement the necessary capital improvements and replacements to the system.
6. Operate within available funds without incurring an unfunded deficit.
7. Maximize the contribution to operating costs from passenger revenues, consistent with reasonable fare levels, to achieve a farebox ratio above 50%.
8. Make every effort to achieve District objectives for female and minority employment and minority business enterprise participation.
9. Improve system access by means of a comprehensive program of parking expansion, BART feeder services, transit coordination, and special projects addressing elderly and handicapped mobility.
10. Develop station area sites for the realization of increased patronage and revenues, and to enhance the communities BART serves.
11. Extend BART trunk lines within Bay Area travel corridors where feasible and in support of regional land use policies.

SYSTEM OVERVIEW

The District currently operates trains over 71 miles of double mainline track, of which 20 miles are in subway, 24 miles are on elevated structures, and 27 miles are at grade. The system's 34 stations include 13 elevated, 14 subway, and 7 at grade which are spaced approximately 1/2 mile apart in downtown San Francisco and Oakland, and approximately 2 to 4 miles apart in suburban areas. Automatic fare collection equipment is located in each station to vend and process patron tickets. Free parking is provided at 22 stations in addition to one fee lot at Lake Merritt Station. Approximately 23,500 automobile spaces are provided systemwide.

Trains are from 3 to 10 cars in length and contain one control equipped vehicle (A-car) at each end with interior vehicles (B-cars) making up the remainder of each consist. All station platforms are approximately 700 feet long to accommodate maximum 10-car trains. As of December 1985, BART's vehicle fleet consists of 137 A-cars and 303 B-cars.

Trains are formed and dispatched from 3 maintenance yards in the Eastbay. The central train control computer at the Lake Merritt Administration Building maintains overall supervision of train movements. Operators onboard the leading A-car of each train have full voice communication with Central Control personnel and passengers onboard, and can override automatic controls should the need arise.

To date, approximately \$1.9 billion has been invested in system construction and equipment. This investment has been financed primarily through local sources including property and sales tax revenues generated within the three BART District counties.

CURRENT SERVICE OVERVIEW

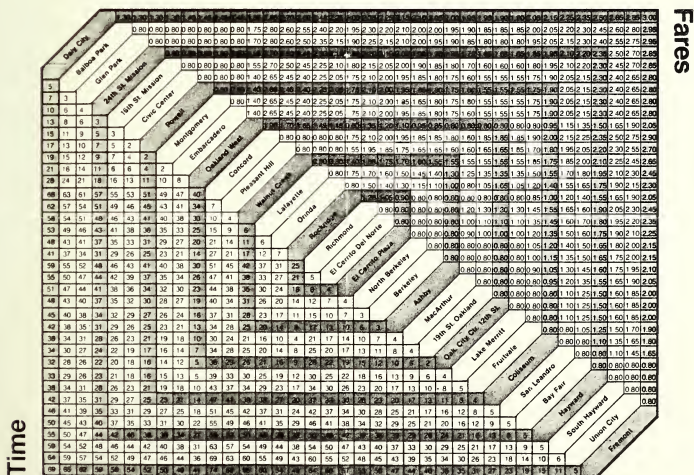
Rail service is provide between the hours of 5 a.m. and 1:30 a.m. Monday through Friday, 5 a.m. to 1:30 a.m. on Saturdays, and 9 a.m. to 1:30 a.m. on Sundays and major holidays. Closings for individual stations are timed with the schedule for the last train beginning at approximately midnight. Service frequencies (in minutes) for individual routes and line segments are as follows:

	TRANSBAY ROUTES			EASTBAY Richmond/ Fremont	CBD LINE SEGMENT	
	Concord/ Daly City	Fremont/ Daly City	Richmond/ Daly City		San Francisco	Downtown Oakland
WEEKDAY						
Peak Hour	7.5	15	15	15	3.8	3.8
Midday	15	15	15	15	5	5
Night	20	*	*	20	20	10
SATURDAY						
Daytime	20	20	20	20	6.7	6.7
Night	20	*	*	20	20	10
SUNDAY/HOLIDAY						
All Day	20	*	*	20	20	10
*Requires transfer between Concord/Daly City and Richmond/Fremont routes						

The District also provides express bus service within major travel corridors not served by rail in both Alameda and Contra Costa counties. Bus service frequencies are as follows:

	<u>Eastern Contra Costa</u>	<u>Western Contra Costa</u>	<u>Central Contra Costa-Alameda</u>	<u>Eastern Alameda</u>
WEEKDAY				
Peak Hour	30	30	30	30
Midday	30	30	30	30
Night	60	60	60	60
SATURDAY				
Daytime	60	30	45	30
Night	60	60	60	60
SUNDAY/HOLIDAY				
All Day	60	*	60	60
* No service during this time period.				

Trains can travel up to 80 miles per hour. Normal operations are based on a 70 mile per hour maximum which results in an average system speed of 32.7 miles per hour including station stops. Regular adult fares and travel times for the rail system are as follows:



A 6.25% rail fare discount is provided through the sale of \$32 tickets for \$30. Free transfers can be made between all BART trains. Special agreements between BART and most other Bay Area operators permit up to a 50% discount for connecting transit service (on a round-trip basis). Additionally, a \$23 BART/MUNI monthly pass is also available, allowing for unlimited BART and San Francisco/MUNI travel within San Francisco.

Fares for handicapped persons, students 5-12 years of age, and persons 65 years of age and older are 10% of the regular adult fare. Children under 5 can ride free. Regular express bus fares are 75¢ and \$1.15 for one and two zone rides, respectively (with a free transfer worth 75¢ for BART patrons leaving a station). Discount bus fares are 15¢ for one zone and 30¢ for two zones for the special fare groups listed above.

C H A P T E R I

P L A N N I N G I S S U E S

The five main issues identified previously in the Short Range Transit Plan will continue to figure prominently in District planning considerations for the foreseeable future. These five issues are:

- o Future Demand Projections
- o New Peak Service Capacity and Demand
- o Service Quality
- o Cost Effectiveness and Productivity
- o Program Delivery

The following issues have gained new prominence recently, or reflect newly defined "emphasis areas" designated by the Urban Mass Transportation Administration:

- o System Extensions
- o Maintenance Requirements
- o Express Bus Effectiveness and Productivity
- o Energy Contingency Requirements
- o Capital Investment Planning
- o Privatization
- o Disadvantaged Business Enterprise
- o Short Range Transit Planning

In the following sections of this chapter, each of these issues will be reexamined in terms of the latest available projections, assumptions, or related information. Based on this general discussion, the plan will focus in the next chapter on a detailed assessment of District functions by program area.

FUTURE DEMAND PROJECTIONS

Expectations regarding future ridership levels are perhaps the key consideration in transit short- and long-range planning. Additional emphasis is given to anticipated peak period riding as the determinant of maximum system capacity requirements. Route-by-route growth patterns will influence the distribution of available capacity, and underscore the need for capital improvements. Patronage projections affect staffing and other resource allocation, especially for vehicle maintenance and power requirements. Taken together with estimates of available financial assistance, annual ridership and revenue projections largely determine future expenditure limits. Future demand assessment is, therefore, the starting point in the SRTP process.

What is the outlook for growth of BART patronage during the upcoming planning period? Existing BART capacity can be utilized more intensively during offpeak periods. However, the system appears to have reached saturation at existing capacity during commute periods.

This section is comprised of three parts: a brief discussion of recent trends and their application to this update, a description of the forecast methodology and step-by-step summary of the forecast, and the resulting implications of the updated forecast vis-a-vis the previous set of projections.

RECENT TRENDS

Growth of BART ridership slowed abruptly during the most recent two quarters ending October-December 1985. In order to observe meaningful trends, non-comparable periods have been excluded in the analysis which follows. In the past, the analysis has focused on trends since the previous fare increase. Although the last BART fare increase occurred in September 1982, the BART/MUNI Fast Pass was introduced in April 1983, prompting a significant increase in patronage. Therefore, this analysis focuses on trends since April 1983 so as to exclude the transition to higher trip making with the Fast Pass during its first year.

The first year of the analysis is April 1983-March 1984. The second year is April 1984-March 1985. The first nine months of the third year, April 1985-December 1985, have also been analyzed.

Because growth rates differ between weekdays and weekends, and holidays and partial holidays are not observed similarly in each quarter, the weekly rate reflecting 5 weekdays plus a weekend is probably the best single indicator of patronage growth. On an average weekly basis, ridership in the second twelve month period following the introduction of the Fast Pass increased 5.7% over that of the prior 12 months. This growth rate is comparable to the long-run compound average annual rate of increase in BART trips observed since the start of Transbay service in 1974 (5.9%).

In contrast, the annual rate of increase in weekly trips during the first three quarters of the third year of the Fast Pass program was only 2.4%. Whether this is a temporary aberration, a reflection of the decreases in gasoline prices (which began in 1981 and continued during the period), or an indication of the impact of BART service disruptions during the most recent two quarters, a projection of future ridership for budget purposes should recognize this leveling off of growth.

The remainder of this section examines patronage trends by day of week and, on weekdays, by time of day. The purpose of this analysis is to identify trends to be utilized in projecting future growth.

Disaggregation of the data by day of week reveals some interesting differences in growth rates, with reduced rates in all three periods. These are as follows:

	<u>Weekdays</u>	<u>Saturdays</u>	<u>Sundays</u>	<u>Weekly</u>
2nd Year Increase ¹	5.2%	9.2%	10.8%	5.7%
3rd Year Increase ²	2.0%	6.6%	3.9%	2.4%

Annual increases in weekday, Saturday and Sunday travel by quarter are summarized in Table I-1 for the past three and one-half fiscal years. Note that

¹ Over the first 12 months of the Fast Pass Program, i.e., Apr 84-Mar 85 vs. Apr 83-Mar 84.

² First nine months vis-a-vis the comparable period a year earlier, i.e., Apr-Dec 85 vs. Apr-Dec 84.

TABLE I-1

QUARTERLY AVERAGE DAILY AND WEEKLY PATRONAGE
AND ANNUAL PERCENTAGE GROWTH RATES SINCE JULY-SEPTEMBER 1982
(Trips In Thousands)

3/28/86 wdb c:TABLE11

	Weekdays		Saturdays		Sundays		Weekly	
	Average Weekday	Annual Growth	Average Saturday	Annual Growth	Average Sunday	Annual Growth	Average Per Week	Annual Growth
July-September 1982	188.7		73.5		48.3		1,065.3	
October-December 1982	181.4		72.8		40.7		1,020.5	
January-March 1983	183.6		67.1		38.5		1,023.6	
BART/MUNI Fast Pass: 4/83								
April-June 1983	191.4		72.8		46.1		1,075.9	
July-September 1983	196.3	4.0%	79.8	8.6%	45.0	-6.6%	1,106.3	3.8%
October-December 1983	203.5	12.2%	77.0	5.8%	43.6	7.1%	1,138.1	11.5%
January-March 1984	205.2	11.8%	80.9	20.6%	43.9	14.0%	1,150.8	12.4%
Average: 1st Year, Fast Pass	199.1		77.6		44.7		1,117.8	
April-June 1984	205.2	7.2%	82.0	12.6%	49.2	6.7%	1,157.2	7.6%
July-September 1984	211.0	7.5%	83.5	4.6%	51.4	14.2%	1,189.9	7.6%
October-December 1984	210.0	3.2%	87.1	13.1%	49.3	13.1%	1,186.4	4.2%
January-March 1985	211.5	3.1%	86.5	6.9%	48.0	9.3%	1,192.0	3.6%
Average: 2nd Year, Fast Pass	209.4	5.2%	84.8	9.2%	49.5	10.8%	1,181.4	5.7%
April-June 1985	213.8	4.2%	88.7	8.2%	55.1	12.0%	1,212.8	4.8%
July-September 1985	214.8	1.8%	87.6	4.9%	52.9	2.9%	1,214.5	2.1%
October-December 1985	210.1	0.0%	92.9	6.7%	47.8	-3.0%	1,191.2	0.4%
Average: 3rd Year, Fast Pass	212.9	2.0%	89.7	6.6%	51.9	3.9%	1,206.2	2.4%

the most recent quarterly rates have dipped below the third year rates indicated above, with no growth in weekday trips versus the same period a year before, and a decline in Sunday ridership.

In the analysis which follows, weekday trips are grouped into three categories:

Offpeak
Peak 4 Hours:
Peak Load Point
Remainder

For weekdays, offpeak growth differs from that of the peak four hour period:

	<u>Offpeak</u>	<u>Peak 4 Hours</u>
2nd Year Increase ¹	9.3%	1.5%
3rd Year Increase ²	4.1%	-0.1%

Growth of ridership in the offpeak periods (weekdays and weekends) has significantly exceeded the peak period rate of increase during the last two years when BART peak capacity has been constrained. This finding underscores the near-term value of the BART Marketing Program, which focuses on increasing offpeak riding, before elements of the Capacity Expansion Program are implemented.

Within the peak period, growth rates differed between those trips which pass through the peak load point on each of the four routes and the remaining peak period trips. In this analysis, peak load point trips are those flowing in the peak direction measured at the busiest point on each route during the peak cycle when all trains on the system pass a given point. (This cycle is monitored regularly for the PM peak in the Quarterly Performance Report and is about 25 minutes longer than the 2-hour PM peak during which all system exits have historically been monitored. For this analysis, the PM peak figures have been doubled to approximate the daily peak load point volumes, after adjusting the peak cycle figures to a 2-hour rate. The remaining trips result from subtracting the peak load point trips from the 4-hour peak total.)

	<u>Peak Load Point</u>	<u>Remainder</u>
2nd Year Increase ¹	2.2%	0.6%
3rd Year Increase ²	-0.5%	0.4%

Annual increases by quarter are summarized for weekdays by time of day in Table I-2. Generally, the most recent rates are the lowest. The sample data indicate a flattening out of peak load point growth. However, this finding

¹ Over the first 12 months of the Fast Pass program, i.e., Apr 84-Mar 85 vs. Apr 83-Mar 84.

² First nine months vis-a-vis the comparable period a year earlier, i.e., Apr-Dec 85 vs. Apr-Dec 84.

TABLE I-2

QUARTERLY AVERAGE WEEKDAY PATRONAGE BY TIME OF DAY
AND ANNUAL PERCENTAGE GROWTH RATES SINCE JULY-SEPTEMBER 1982
(Trips In Thousands)

3/28/86 wdb c:TABLE12

	PEAK 4 HOURS PEAK LOAD POINT	GROWTH RATE	PEAK 4 HOURS REMAINDER	GROWTH RATE	PEAK 4 HOURS TOTAL	GROWTH RATE	OFFPEAK	GROWTH RATE
July-September 1982	53.8		39.8		93.6		95.1	
October-December 1982	52.5		40.3		92.8		88.6	
January-March 1983	53.3		42.7		96.0		87.6	
BART/MUNI Fast Pass: 4/83								
April-June 1983	53.9		49.7		103.6		87.7	
July-September 1983	54.0	0.4%	45.3	13.8%	99.3	6.1%	97.0	2.0%
October-December 1983	56.5	7.6%	49.2	22.1%	105.7	13.9%	97.8	10.4%
January-March 1984	58.2	9.2%	50.2	17.6%	108.4	12.9%	96.7	10.4%
Average: 1st Year, Fast Pass								
	55.7		48.6		104.3		94.8	
April-June 1984	55.1	2.2%	51.7	4.0%	106.8	3.1%	98.4	12.2%
July-September 1984	56.3	4.3%	46.7	3.1%	103.0	3.7%	108.0	11.3%
October-December 1984	58.2	3.0%	46.6	-5.3%	104.8	-0.9%	105.1	7.5%
January-March 1985	58.0	-0.3%	50.6	0.8%	108.6	0.2%	102.9	6.4%
Average: 2nd Year, Fast Pass								
	56.9	2.2%	48.9	0.6%	105.8	1.5%	103.6	9.3%
April-June 1985	57.1	3.6%	48.3	-6.6%	105.4	-1.3%	108.4	10.2%
July-September 1985	56.1	-0.4%	47.8	2.4%	103.9	0.9%	111.0	2.8%
October-December 1985	55.6	-4.5%	49.5	6.2%	105.1	0.3%	105.0	-0.1%
Average: 3rd Year, Fast Pass								
	56.3	-0.5%	48.5	0.4%	104.8	-0.1%	108.1	4.1%

must be considered preliminary and subject to further confirmation because of possible sample limitations.

Perhaps the most significant recent development in BART ridership trends is the apparent leveling off of the remaining trips during the peak four hours. This development represents a major change from prior trends. In the previous plan, growth of this market segment was determined to be well above the weekday average. Based on excess capacity within San Francisco and elsewhere on the system, it was assumed that this segment was not constrained and would continue to grow despite capacity constraint through the peak load points. Since this segment accounts for 46% of the peak four hour demand, this leveling off, when incorporated into the revised future projections, will account for most of the difference between current and prior BART patronage forecasts.

The trends suggested by the growth rates reported in the Tables I-1 and I-2 are lower (conservative) than those previously observed and used as the basis for prior year forecasts. However, because the significant slowdown (as measured by a weekly annual growth rate of less than 3.5%) has only occurred during the past two quarters, it is probably too soon to conclude that lower growth rates of BART travel except during the congested peak period are a confirmed pattern.

If the last quarter is considered an aberration to be excluded from the average of the last three quarters, the growth rates are somewhat higher, as follows:

	<u>Last 3 Quarters</u> <u>(April-Dec. 1985)</u>	<u>Prior 2 Quarters</u> <u>(April-Sept. 1985)</u>
Weekdays	2.0%	3.0%
Peak 4 Hours	-0.1%	-0.2%
Peak Load Point	-0.5%	1.6%
Remainder	0.4%	-2.3%
Offpeak	4.1%	6.3%
Saturdays	6.6%	6.5%
Sundays	3.9%	7.4%

Given the variation in rates just indicated, and the uncertainty about future trends, especially in view of the possibility of continuing erosion of world oil prices, it seems reasonable to define an upper and lower set of growth rates for forecast purposes.

FORECAST METHODOLOGY AND PROJECTIONS

In the absence of a workable regional travel demand model which can accurately project submodal splits (transit travel by BART vs. bus) reliance continues to be placed primarily on a trend-based forecast methodology for updating BART travel demand during the next five-year period. The January 1986 fare

increase presents an added uncertainty to the analysis in that it is too soon to fully verify the accuracy of projected ridership decreases and the ensuing trend.

The forecast methodology involves three steps:

1. Projections are made at 1985 fare levels first. This step applies to all but the peak load point estimates. Projections are based on the appropriate recently observed trend rates. These rates are assumed to continue through time based on performance to date and the expectation that BART parking capacity and other means of access will be improved during the planning period.

For weekday offpeak and Sunday, the rates for the last three quarters (4.1% and 3.9%) are proposed for the lower growth set, and the higher growth set would be defined by the prior two quarters (6.3% and 7.4%). Saturday rates would be the same for each set, at 6.5% annually. For the remaining trips during the peak four hours, it is proposed that the rate observed on average over the last three quarters (0.4%) be utilized for both sets, given the recent fluctuation of these rates and the unlikely prospect of negative growth in the peak period when BART is most competitive.

Future patronage projections for all segments except new weekday peak load point trips are shown in Table I-3 by fiscal year through 90/91. Note that, in effect, existing peak load point demand is assumed to remain unchanged in this tabulation. Not all routes are constrained during the peak period, but additional growth accommodated by existing capacity is estimated in conjunction with the projected response to future capacity increases discussed under Step 2 below. Estimates reflect both the "low" and "high" growth assumptions described above. Total annual ridership without the new weekday peak direction trips averages 2.6% to 2.8% annually with the "low" growth assumptions, and 3.8% to 4.1% per year with the "high" growth assumptions.

2. Weekday peak load point demand is next projected by route using a growth model which relates anticipated load factors to subsequent rates of increase in patronage. This process projects the demand response to increases in the peak direction capacity as cars and trains are added in the future, based on an evaluation of demand/capacity conditions by route. This model is based on the observed relationship between peak period load factors and the average annual increase in demand by route since the September 1982 fare increase (note that the maximum load points on each of the four routes are not in San Francisco and therefore are not affected by Fast Pass Travel).

The load factor-growth rate model was discussed in the previous five-year plan and has been updated for application in this analysis. This model is shown graphically in Figure I-1. For each route, the load factor at existing capacity is calculated for the base year and a corresponding growth rate is determined from the model. If no capacity increase is programmed for the route, the next year's incremental ridership increase is determined by the growth factor. With no increase in capacity, the load factor increases and the next year's growth factor diminishes, in some cases (when the capacity constrained load factor is reached) to a point of no growth.

Table I-3

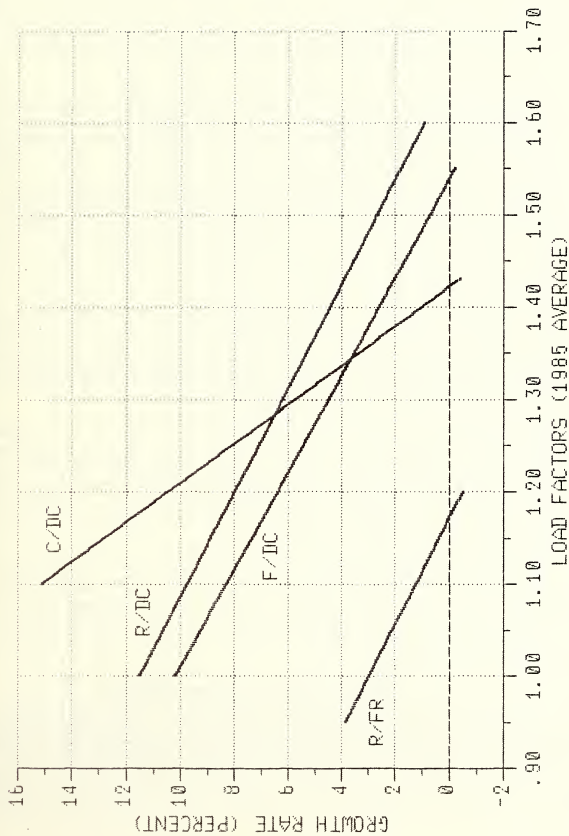
PAINANCE FORECAST FOR 1986 FIVE-YEAR PLAN UPDATE
BASED ON "LOW" AND "HIGH" GROWTH ASSUMPTIONS
(All Segments Except "Peak Load Point")

web 2/3/86 c:110107P

	FY 84/85 ACTUAL	ESTIMATED ± CHANGE	FY 85/86 ESTIMATED	ASSUMED ANNUAL GROWTH RATE	FY 86/87 PROJECTED	FY 87/88 PROJECTED	FY 88/89 PROJECTED	FY 89/90 PROJECTED	FY 90/91 PROJECTED
PAINANCE AT 1985 FARES: "LOW" GROWTH									
PEAK LOAD POINT, WEEKDAYS At Current Capacity	57.4	-2.42	56.0		56.0	56.0	56.0	56.0	56.0
Response to New Service	57.4		56.0		56.0	56.0	56.0	56.0	56.0
NON-PEAK DIRECTION, DAILY									
Remaining Weekday Peak Period	48.1	0.42	48.3	1.004	48.5	48.7	48.9	49.1	49.3
Subtotal, Peak Four Hours	105.5	-1.12	104.3		104.5	104.7	104.9	105.1	105.3
Weekday Offpeak	106.2	4.12	110.6	1.041	115.1	119.9	124.8	129.9	135.2
Subtotal, Average Weekday	211.7	1.52	214.9		219.6	224.5	229.7	235.0	240.5
Saturday	86.5	6.38	92.1	1.065	98.1	104.5	111.3	118.5	126.2
Sunday	51.0	3.52	53.0	1.039	55.1	57.2	59.4	61.6	64.2
WEEKLY (5 Weekdays Plus Weekend)	1,196.0	2.02	1,219.6		1,251.3	1,284.4	1,319.0	1,355.1	1,392.8
ANNUAL TOTAL	61,345.2	2.02	62,559.6		64,188.7	65,890.0	67,667.0	69,523.2	71,462.5
PERCENTAGE INCREASE OVER PRIOR YEAR					2.62	2.72	2.72	2.72	2.82
PAINANCE AT 1985 FARES: "HIGH" GROWTH									
PEAK LOAD POINT, WEEKDAYS At Current Capacity	56.0		56.0		56.0	56.0	56.0	56.0	56.0
Response to New Service	56.0		56.0		56.0	56.0	56.0	56.0	56.0
NON-PEAK DIRECTION, DAILY									
Remaining Weekday Peak Period	48.3		48.3	1.004	48.5	48.7	48.9	49.1	49.3
Subtotal, Peak Four Hours	104.3		104.3		104.5	104.7	104.9	105.1	105.3
Weekday Offpeak	110.6		110.6	1.063	117.6	125.0	132.8	141.2	150.1
Subtotal, Average Weekday	214.9		214.9		222.1	229.7	237.7	246.3	255.4
Saturday	92.1		92.1	1.065	98.1	104.5	111.3	118.5	126.2
Sunday	53.0		53.0	1.074	56.9	61.1	65.7	70.5	75.7
WEEKLY (5 Weekdays Plus Weekend)	1,219.6		1,265.3		1,285.3	1,313.9	1,365.6	1,420.5	1,478.9
ANNUAL TOTAL	62,559.6		64,906.1		66,906.1	67,404.4	70,058.2	72,879.5	75,879.1
PERCENTAGE INCREASE OVER PRIOR YEAR					3.82	3.82	3.92	4.02	4.12
DIFFERENCE BETWEEN "HIGH" AND "LOW"					719.4	1,514.4	2,391.2	3,356.3	4,416.7

LOAD FACTOR GROWTH RATE MODEL

Based on Compound Growth 1982-1985



Because peak load point capacity is constrained, the interaction between the January 1986 fare increase, and resulting patronage loss and lower load factors need to be examined systematically beginning with the projected impact of the fare increase. This analysis is summarized in Table I-4. The FY 85/86 estimates reflect the projected impact of the January 1986 fare increase. Note that, with the ridership reduction following the fare increase, the peak hour load factors are reduced on the two most heavily travelled routes (Concord and Fremont/Daly City) in comparison with the FY 84/85 levels. (Demand and load factors on the other, unconstrained routes are higher than FY 84/85 levels after the fare increase because projected year-to-year growth rates exceed the anticipated erosion due to the fare increase.)

A planned increase in capacity lowers the load factor and raises the growth projection for the next year. Where demand has been constrained for more than one year (thereby effectively halting any further growth in ridership), new capacity is assumed to be met with an instantaneous demand response equivalent to the number of new seats added. This is projected for both the Concord and Fremont/Daly City routes in the peak hour. In addition to this "backlog" effect, the new capacity and resulting load factor produce a growth response as well during the following year. The results of this process are shown in detail in Table I-4 for the PM peak cycle. The capacity increases assumed in this analysis are generally as shown in the 1985 Five-Year Plan, and are discussed in more detail below.

For purposes of estimating systemwide demand, the PM peak projections reflected in Table I-4 have been expanded to represent both peak periods by assuming that the AM peak cycle is the mirror image of the PM peak. In addition, the increments have been converted to annualized average daily estimates (where the backlog effect is for less than the full year). These projections are summarized in Table I-5.

3. The 1985 fare level projections shown in Table I-3, for all segments except the peak load point trips, are next factored down by the expected shrinkage (based on the assumed elasticity of demand) resulting from the most recent fare increase, and subsequently for the increase planned in 1989. The "low" and "high" estimates are summarized in Tables I-6 and I-7 respectively. These estimates include the projected peak load point trips at the appropriate fare level.

The projections were adjusted for the 1986 and 1989 fare increases targeted in the 1985 Five-Year Plan of 30% in January 1986 and 15% in January 1989. The "low" patronage projections are summarized in Tables I-6A and I-6B, and the "high" estimates in Tables I-7A and I-7B. These estimates assume demand elasticities of -0.15 in the peak period and -0.37 in the offpeak.

IMPLICATIONS OF THE 1986 FORECAST

The five-year demand estimates summarized above are generally lower than the patronage forecast in the 1985 Five-Year Plan and the preliminary estimates prepared earlier in the 1986 Plan update process. Virtually all of the variance from the previous estimates is explained by currently projected lower growth of ridership during the peak four-hour period. The new offpeak and weekend projections are comparable or slightly higher than the previous

PROJECTED PH PEAK LOAD POINT AVERAGE WEEKDAY PATRONS GROWTH
BY ROUTE AND TIME SEQUENCE, FY 85/86 - FY 90/91
BASED ON UPDATED PART LOAD FACTOR - GROWTH RATE MODEL OF PEAK DEMAND

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	FY 84/85	FY 85/86*	FY 86/87*	FY 87/88*	FY 88/89*	FY 89/90*	FY 90/91*
PEAK 60 MINUTES							
Concord/Daily City							
Load Factor	1.45	1.39	1.41	1.42	1.34	1.29	1.37
Growth Rate Over Prior Year	0.02	—	1.42	0.42	0.22	3.92	6.32
Increment		-259	92	33	584	281	472
Total Trips	6,718	6,459	6,551	6,584	7,178	7,459	7,931
Fremont/Daily City							
Load Factor	1.56	1.50	1.42	1.45	1.37	1.28	1.34
Growth Rate Over Prior Year	0.02	—	0.72	2.32	1.72	4.52	5.02
Increment		-189	754	126	697	196	322
Total Trips	4,902	4,713	5,467	5,593	6,290	6,486	6,808
Richmond/Daily City							
Load Factor	1.35	1.37	1.44	1.18	1.25	1.27	1.35
Growth Rate Over Prior Year	5.22	—	5.02	3.82	8.42	7.12	6.72
Increment		-34	147	117	197	242	245
Total Trips	2,910	2,944	3,091	3,208	3,405	3,647	3,892
Richmond/Fremont							
Load Factor	1.18	1.13	1.14	0.88	0.90	0.95	0.98
Growth Rate Over Prior Year	0.02	—	0.02	0.52	5.12	4.72	3.92
Increment		-44	10	8	48	78	69
Total Trips	1,561	1,597	1,607	1,615	1,663	1,741	1,810
Balance of Peak Cycle							
Concord/Daily City							
Load Factor	1.30	1.32	1.28	1.10	1.12	1.26	1.36
Growth Rate Over Prior Year	5.22	—	5.02	6.82	15.22	14.42	7.52
Increment		65	289	414	832	1,050	626
Total Trips	5,709	5,774	6,063	6,477	7,309	8,359	8,985
Fremont/Daily City							
Load Factor	1.29	1.30	1.36	1.12	1.12	1.14	1.22
Growth Rate Over Prior Year	4.62	—	4.52	3.42	7.92	8.02	7.52
Increment		21	168	132	225	338	343
Total Trips	3,678	3,699	3,867	3,999	4,224	4,562	4,905
Richmond/Daily City							
Load Factor	1.22	1.26	1.35	1.10	1.11	1.12	1.22
Growth Rate Over Prior Year	7.62	—	6.82	5.32	9.72	9.42	9.42
Increment		105	214	178	261	362	388
Total Trips	3,033	3,138	3,352	3,530	3,791	4,153	4,541
Richmond/Fremont							
Load Factor	1.08	1.04	1.07	1.09	1.08	1.10	1.11
Growth Rate Over Prior Year	0.62	—	2.22	1.82	1.52	1.62	1.32
Increment		-53	35	29	-10	26	21
Total Trips	1,618	1,565	1,600	1,629	1,619	1,645	1,666
TOTAL PH PEAK CYCLE							
Growth Rate Over Prior Year	-1.12		5.72	3.32	8.72	7.32	6.52
Increment		-340	1,709	1,037	2,844	2,573	2,486
Total Trips	30,229	29,889	31,596	32,635	35,479	38,052	40,538

* Adjusted for 30% fare increase effective January 1986. # Adjusted for proposed 15% fare increase January 1989.

TABLE I-5

SUMMARY OF PROJECTED PEAK LOAD POINT PATRONAGE GROWTH

	<u>FY 86/87</u>	<u>FY 87/88</u>	<u>FY 88/89*</u>	<u>FY 88/89#</u>	<u>FY 89/90</u>	<u>FY 90/91</u>
PM PEAK 60 MINUTES						
Response to Prior Year Load Factor						
Concord/Daly City	92	33	11	-137	281	472
Fremont/Daly City	34	126	95	-118	196	322
Richmond/Daly City	147	117	269	-72	242	245
Richmond/Fremont	10	8	83	-35	78	69
Backlog of Demand After Removal of Capacity Constraint						
Concord/Daly City			720	720		
Fremont/Daly City	720		720	720		
Subtotal, PM Peak 60 Minutes	1,003	284	1,898	1,078	797	1,108
BALANCE OF PM PEAK CYCLE						
Response to Prior Year Load Factor						
Concord/Daly City	289	414	987	-155	1,050	626
Fremont/Daly City	168	132	316	-90	338	343
Richmond/Daly City	214	178	341	-80	362	388
Richmond/Fremont	35	29	24	-34	26	21
Subtotal, Balance of PM Peak Cycle	706	753	1,668	-359	1,776	1,378
TOTAL, AM AND PM PEAK CYCLES						
Response to Prior Year Load Factor	1,978	2,074	4,252	-1,442	5,146	4,972
Backlog of Demand After Removal of Capacity Constraint	1,440	0	2,880	2,880	0	0
Total, AM & PM Peak Cycles	3,418	2,074	7,132	1,438	5,146	4,972
ANNUALIZED CUMMULATIVE INCREASE						
Response to Prior Year Load Factor						
FY 86/87	1,978	1,978	1,978	1,978	1,978	1,978
FY 87/88		1,901	2,074	2,074	2,074	2,074
FY 88/89, Before Fare Increase			2,835	2,835	4,252	4,252
FY 88/89, After Fare Increase				-1,442	-1,442	-1,442
FY 89/90					5,146	5,146
FY 90/91						4,972
Backlog of Demand After Removal of Capacity Constraint						
FY 86/87 @ 6/12'S Annual Average	720	1,440	1,440	1,440	1,440	1,440
FY 88/89 @ 1/12'S Annual Average			1,440	1,440	2,880	2,880
Annualized Total Increment	2,698	5,319	9,767	8,325	16,328	21,300

* Before proposed January 1989 fare increase.

After 15% fare increase.

TABLE 6A

LOW PATRONS FORECAST FOR 1986 FIVE YEAR PLAN UPDATE
(All Trips In Thousands)

	FARE INCREASE RETENTION FACTOR	FY 84/85		FY 85/86		FY 86/87		FY 87/88	
		ACTUAL	WEEKLY	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT
PATRONS AT 1985 FARES									
PEAK LOAD POINT									
Weekdays, at Current Capacity		57.4	287.0	-2.45	56.0	-7.0			
Weekdays, Response to New Service		0.0	0.0		0.0	0.0			
Subtotal, Peak Direction		57.4	287.0		56.0	-7.0			
NON-PEAK DIRECTION									
Weekdays, Remaining Peak Period Trips		48.1	240.5	0.45	48.3	1.0			
Subtotal, Peak 4 Hours		105.5	527.5		104.3	-6.0			
Weekdays, Offpeak (Midday & Evening)		106.2	550.9	4.75	110.6	22.1			
Subtotal, Average Weekday		211.7	1,058.4		214.9	16.1			
Saturday		86.5	86.5	6.55	92.1	5.6			
Sunday		51.0	51.0	4.05	53.0	2.0			
Subtotal, Non-Peak Direction			908.8			30.8			
Annual Total Patronage at Current Fares		60,798			62,500				
NET RAIL REVENUE TOTAL		66,441			\$68,190				
Annual Total PASSENGER MILES		789,292			810,772				
PATRONS AFTER 30% FARE INCREASE IN 1986									
PEAK LOAD POINT									
Weekdays, at Current Capacity	96.145				54.9	-6.9	55.8	-5.4	55.8
Weekdays, Response to New Service	96.145				0.0	0.0	2.7	13.5	5.3
Subtotal, Peak Direction					54.9	-6.9	56.5	8.1	56.2
NON-PEAK DIRECTION									
Weekdays, Remaining Peak Period Trips	96.145				47.4	1.0	46.6	-3.7	46.8
Subtotal, Peak 4 Hours					102.3	-5.9	103.2		106.0
Weekdays, Offpeak (Midday & Evening)	90.755				105.5	21.1	104.5	-5.2	108.8
Subtotal, Average Weekday					207.8	15.2	207.6		214.8
Saturday	90.755				87.8	5.1	89.0	1.2	94.8
Sunday	90.755				50.5	1.8	50.0	-0.5	51.9
Subtotal, Non-Peak Direction						29.1		-8.2	30.5
Annual Total Patronage after 30% Increase					60,386		60,380		62,616
NET RAIL REVENUE TOTAL					\$75,784		\$85,759		\$88,915
Annual Total PASSENGER MILES					787,600		787,220		811,504

TABLE I-64

LOW-PATRONAGE FORECAST FOR 1986 FIVE YEAR PLAN UPDATE
(All Trips in Thousands)

FARE INCREASE RETENTION FACTOR	FY 87/88		FY 88/89		FY 89/90		FY 90/91	
	DAILY INCREMENT	WEEKLY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT
PATRONAGE AFTER 30% FARE INCREASE IN 1986								
PEAK LOAD POINT								
Weekdays, At Current Capacity	53.8	0.0		53.8	0.0			
Weekdays, Response to New Service	5.3	13.1		9.8	22.2			
Subtotal, Peak Direction	59.2	13.1		63.6	22.2			
NON-PEAK DIRECTION								
Weekdays, Remaining Peak Period Trips	46.8	1.0	0.45	47.0	1.0			
Subtotal, Peak 4 Hours	106.0			110.6				
Weekdays, Offpeak (Midday & Evening)	108.8	21.8	4.15	115.3	22.2			
Subtotal, Average Weekday	214.8			225.9				
Saturday	94.8	5.8	6.55	101.0	6.2			
Sunday	51.9	1.9	3.85	55.9	2.0			
Subtotal, Non-Peak Direction	30.5			31.4				
Annual Total Patronage after 30% Increase	62,616		4.45	65,367				
NET RAIL REVENUE TOTAL	\$88,915			\$92,821				
Annual Total PASSENGER MILES	811,504			847,157				
PATRONAGE AFTER 15% FARE INCREASE IN 1989								
PEAK LOAD POINT								
Weekdays, At Current Capacity	97.935			53.3	-2.8	52.7	-2.8	52.7
Weekdays, Response to New Service	97.935			8.3	15.0	16.3	40.0	21.3
Subtotal, Peak Direction				61.6	12.2	69.1	37.2	74.0
NON-PEAK DIRECTION								
Weekdays, Remaining Peak Period Trips	97.935			46.5	-1.5	46.2	-1.5	46.4
Subtotal, Peak 4 Hours				108.1		115.3		120.4
Weekdays, Offpeak (Midday & Evening)	94.965			110.4	8.0	111.9	7.7	116.5
Subtotal, Average Weekday				218.5		227.2		237.0
Saturday	94.965			98.5	5.6	57.5	3.7	60.8
Sunday	94.965			52.5	0.6	1.45	0.7	55.3
Subtotal, Non-Peak Direction				10.8		3.95	10.6	5.3
Annual Total Patronage after 15% Increase				63,797		66,248		69,191
NET RAIL REVENUE TOTAL				\$97,163		\$108,184		\$112,989
Annual Total PASSENGER MILES				826,810		858,580		896,720

"LIGHT" PATRONAGE FORECAST FOR 1986 FIVE YEAR PLAN UPDATE

TABLE 7A

(All Trips in Thousands)

FARE INCREASE RETENTION FACTOR	FY 84/85		FY 85/86		FY 86/87		FY 87/88	
	ACTUAL	WEEKLY	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT
PATRONAGE AT 1985 FARES								
PEAK LOAD POINT								
Weekdays, at Current Capacity	57.4	287.0	-2.4%	56.0	-7.0			
Weekdays, Response to New Service	0.0	0.0		0.0	0.0			
Subtotal, Peak Direction	57.4	287.0		56.0	-7.0			
NON-PEAK DIRECTION								
Weekdays, Remaining Peak Period Trips	48.1	240.5	0.4%	48.3	1.0			
Subtotal, Peak 4 Hours	105.5	527.5		104.3	-6.0			
Weekdays, Offpeak (Midday & Evening)	106.2	530.9	4.2%	110.6	22.1			
Subtotal, Average Weekday	211.7	1,058.4		214.9	16.1			
Saturday	86.5	86.5	6.5%	92.1	5.6			
Sunday	51.0	51.0	4.0%	53.0	2.0			
Subtotal, Non-Peak Direction	908.8			30.8				
Annual Total Patronage at Current Fares	60,798		2.9%	62,560	33.9			
NET RAIL REVENUE TOTAL	\$66,441			\$68,190	\$34			
Annual Total PASSENGER MILES	789,292			810,772	413			

PATRONAGE AFTER 3% FARE INCREASE IN 1986

PEAK LOAD POINT								
Weekdays, At Current Capacity	96.14%		54.9	-6.9	53.8	-5.4	53.8	0.0
Weekdays, Response to New Service	96.14%		0.0	0.0	5.5	13.5	5.5	14.0
Subtotal, Peak Direction			54.9	-6.9	56.5	8.1	59.3	14.0
NON-PEAK DIRECTION								
Weekdays, Remaining Peak Period Trips	96.14%		47.4	1.0	46.6	-3.7	46.8	1.0
Subtotal, Peak 4 Hours	90.75%		105.3	-5.9	103.2	106.2	106.2	33.6
Weekdays, Offpeak (Midday & Evening)			105.5	21.1	106.7	6.0	113.4	33.6
Subtotal, Average Weekday			207.8	15.2	209.9		219.6	
Saturday	90.75%		82.8	5.1	89.0	1.2	94.8	5.8
Sunday	90.75%		50.5	1.8	51.7	1.1	55.5	3.8
Subtotal, Non-Peak Direction			29.1		4.6		44.2	
Annual Total Patronage after 3% Increase			60,386	-7.9	61,038	12.5	64,025	57.4
NET RAIL REVENUE TOTAL			\$75,764	\$180	\$86,674	\$209	\$90,915	\$82
Annual Total PASSENGER MILES			782,600	-129	791,056	163	829,763	744

TABLE 1-7B

"LIGHT" PATRONAGE FORECAST FOR 1986 FIVE YEAR PLAN UPDATE

(All Trips in Thousands)

FARE INCREASE RETENTION FACTOR	FY 87/88		FY 88/89		FY 89/90		FY 90/91	
	WEEKLY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR
PATRONAGE AFTER 30% FARE INCREASE IN 1986								
PEAK LOAD POINT								
96-142	53.8	0.0	53.8	0.0				
96-142	5.5	14.0	12.1	33.3				
Subtotal, Peak Direction	59.3	14.0	66.0	33.3				
NON-PEAK DIRECTION								
96-142	46.8	1.0	47.0	1.0				
Subtotal, Peak 4 hours	106.2		113.0					
90-752	113.4	33.6	6.32	120.6	35.7			
Subtotal, Average Weekday	219.6		233.6					
90-752	94.8	5.8	6.52	101.0	6.2			
90-752	55.5	3.8	7.42	59.6	4.1			
Subtotal, Non-Peak Direction	44.2		47.0					
Annual Total Patronage after 30% Increase	64,025	57.4	6.42	68,140	79.1			
NET RAIL REVENUE TOTAL	\$90,915	\$82	\$96,759	\$112				
Annual Total PASSENGER MILES	829,763	744	883,097	1,026				

PATRONAGE AFTER 15% FARE INCREASE IN 1989									
PEAK LOAD POINT									
Weekdays, At Current Capacity	97.932	53.3	-2.8	52.7	-2.8	52.7	-2.8	52.7	-2.8
Weekdays, Response to New Service	97.932	11.4	29.7	16.3	24.5	21.3	24.5	21.3	24.5
Subtotal, Peak Direction		64.7	26.9	69.1	21.7	74.0	24.9	74.0	24.9
NON-PEAK DIRECTION									
Weekdays, Remaining Peak Period Trips	97.932	46.5	-1.5	46.2	-1.5	46.4	0.9	46.4	0.9
Subtotal, Peak 4 hours		111.2		115.3		120.4		120.4	
Weekdays, Offpeak (Midday & Evening)	94.962	117.5	20.5	3.62	121.7	20.9	6.32	129.4	38.3
Subtotal, Average Weekday		228.8		237.0		249.8		249.8	
Saturday	94.962	98.5	3.6	3.72	102.1	3.7	6.52	108.8	6.6
Sunday	94.962	58.1	2.6	4.62	60.8	2.7	7.42	65.3	4.5
Subtotal, Non-Peak Direction		25.3		25.8		50.4		50.4	
Annual Total Patronage after 15% Increase		66,700	51.4	3.72	69,137	46.9	5.62	72,999.8	74.3
NET RAIL REVENUE TOTAL		\$101,584	\$205	\$112,901	\$218	\$119,209		\$121	
Annual Total PASSENGER MILES		884,435	667	896,016	607	946,078		963	

estimates. The current and previously projected ridership estimates are summarized below (in millions).

<u>Fiscal Year</u>	<u>85 Plan</u>	<u>86 "Low"</u>	<u>86 "High"</u>
85/86	61.8	60.4	60.4
86/87	63.0	60.4	61.0
87/88	67.4	62.7	64.0
88/89	70.5	64.6	66.7
89/90	73.4	66.2	69.1

The new projections translate directly into reduced net rail revenue estimates as indicated below (in \$ millions).

<u>Fiscal Year</u>	<u>85 Plan</u>	<u>86 "Low"</u>	<u>86 "High"</u>
85/86	\$77.3	\$75.8	\$75.8
86/87	\$89.5	\$85.7	\$86.7
87/88	\$95.7	\$89.0	\$90.9
88/89	\$107.9	\$98.4	\$101.6
89/90	\$119.7	\$108.2	\$112.9

The new estimates range from \$2.8-3.8 million less than the 1985 plan in FY 86/87 up to \$6.8-11.5 million less in FY 89/90. If not offset by comparable revenue increases from other sources, or correspondingly lower cost estimates, these reductions in fare revenue will force a careful reexamination of the District's five-year operating budget financial plan.

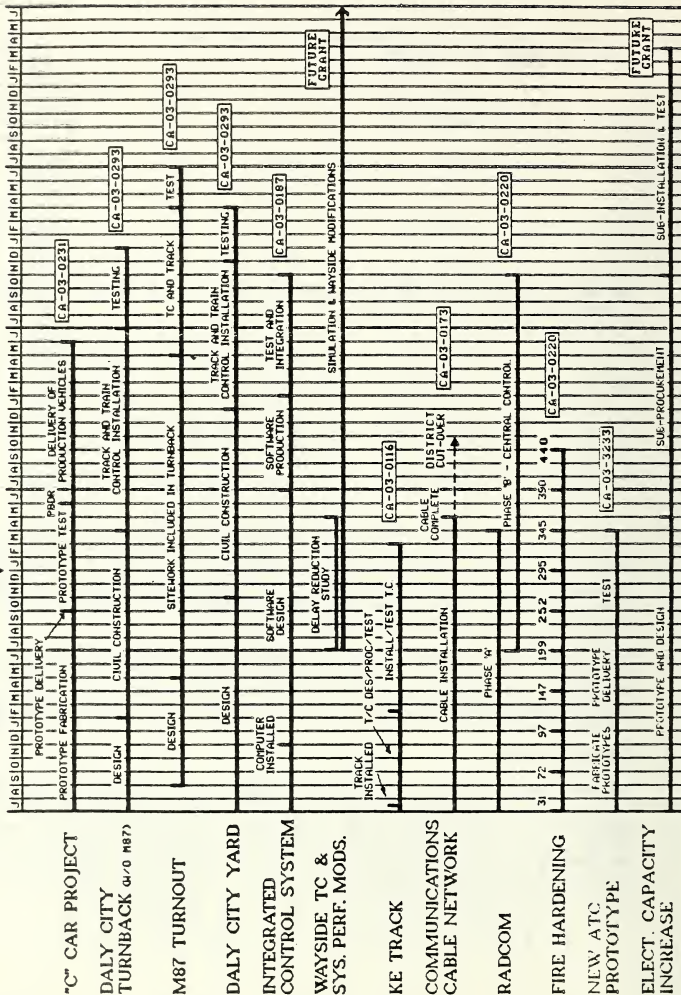
The 1986 patronage forecast update is somewhat more conservative than previous estimates. Note, however, in Table I-4 that peak load point ridership is projected to increase by one-third over the next five years. Without the Capacity Expansion Program, this extra ridership could not be accommodated by the existing system.

ADEQUATE CAPACITY

Increasing BART's capacity is the goal of the District's Capacity Expansion Program which is now well underway. Updates to project schedules have been made since last year's Short Range Transit Plan. The current status of major project schedules is summarized in Figure I-2. Note that the completion dates or schedule indicated here and elsewhere in this document for these projects refer to the most recent planning estimates for project completion and may differ from contract schedule dates.

MAJOR PROJECT SCHEDULES

FY 84/85 FY 85/86 FY 86/87 FY 87/88 FY 88/89



The BART Capacity Expansion Program developed in its current form in the 1983 Short Range Transit Plan is shown in Table I-8. The program is designed to reduce minimum headways, thereby permitting more trains to be placed in service. Projects required to achieve or support each successive headway reduction are identified together with their respective completion dates.

After each necessary set of projects is complete, service expansion can take place. The proposed target dates for service expansion are shown in Table I-8. The target dates reflect current plans for capital project implementation. Completion dates may be altered by funding limitations or changes necessary for smooth project implementation. The key consideration in adding new service is to maintain or enhance current reliability standards, even if that requires additional time for solving problems and testing in order to assure a smooth transition to higher service levels. BART's guiding philosophy is to insist on high-quality service.

Each higher service level is characterized by the number of peak-hour, peak-direction Transbay trains, the total number of peak-period trains and cars on-line, the spare car requirements, and the total cars required. Projected availability figures are shown for comparison purposes. The C-Car project will add 150 vehicles to the District fleet. The impact of the C-Car delivery schedule on total fleet size during the planning period is indicated in Table I-8.

Current BART service is nearly at capacity in terms of effective use of available B-Cars. Although additional A-Cars are available, any new trains would require taking B-Cars from already scheduled consists. For this reason, no more peak service trains will be added until after the vehicle fire hardening program is completed in October 1986, as is shown in Table I-8. Completion of this program and commencement of delivery of the new C-Cars will augment the fleet somewhat by late 1987. But significant expansion of capacity will not be possible until September 1988 when all of the new C-Cars are delivered and available for service and four key capacity expansion projects are completed: the Daly City Turnback, the new Integrated Control System (ICS), removal of the vent separation requirement based on CPUC authorization, and the third rail and yard components of the electrification upgrade.

SERVICE EXPANSION CONSIDERATIONS

For several years it has been recognized that BART capacity expansion is essential. Peak load point ridership is approaching the average peak hour crowding limits that patrons are apparently willing to tolerate. Latent demand survey research indicates that current potential ridership is several times the number of commuters actually using the system. Growth of new CBD-oriented peak period travel is likely, given current and projected office expansion plans in San Francisco and Oakland. Significant expansion of alternate highway transportation capacity, especially during the next few years in the Transbay corridor, is not planned.

TABLE I-8

BART CAPACITY EXPANSION PROGRAM

3/21/86

MINIMUM HEADWAY CAPABILITY (MIN:SEC)	PROJECTS REQUIRED TO ACHIEVE OR SUPPORT THIS HEADWAY	ANTICIPATED PROJECT COMPLETION DATES	TARGETED EXPANDED SERVICE START DATES	PEAK HOUR TRAINS PEAK DIRECTION TRANSBAY	PEAK PERIOD CAPACITY ON-LINE TRAINS	SPARE CARS	TOTAL CARS REQUIRED	AVAILABLE FLEET A/C-CARS 885% B-CARS 890% (EXTRA)	OPERATING FLEET SIZE
3:45	CURRENT SERVICE	---	JUL 80	16	43	A 86 B 235 C 321	16 24 40	102 259 361	128 290 4180
3:30	KE TRACK	MAR 86	1)						
	FIRE HARDENING (CARS COMPLETED)	OCT 86	JAN 87	17	45	A 90 B 246 C 336E	16 24 40	106 270 376	135 300 435F
	DELIVERY OF 48 C-CARS	SEP 87	2)	17	48	A 96 B 41 C 383G	16 0 40	112 270 423	135 48 300 483F
3:10	FIRE HARDENING (REMOVAL OF VENT SEPARATION)	OCT 87	3)						
	ICS	OCT 87							
	DAILY CITY TURNBACK	DEC 87							
	ELECT. CAPACITY INCREASE: INSTALL 3RD RAIL & YARD FEEDER	APR 88							
	DELIVERY OF 102 ADDITIONAL C-CARS (150-TOTAL)	SEP 88	JAN 89	19	50H	A 108 B 92H C 246H D 440I	6 27 24 57	114 119 270 503	135 150 300 585F
2:30	DAILY CITY YARD	MAR 88	4)						
	NEW ON-BOARD ATC (A-CAR RETROFIT)	JUL 88							
	M-87 INTERLOCKING	JUL 88							
	ELECT. CAPACITY INCREASE: PROCURE & INSTALL SUB-STATION	MAR 89							
	WAYSIDE TRAIN CONTROL/SYSTEM PERFORMANCE MODS	JUL 89	SEP 89	24	57	A 114 B 90 C 246 D 450J	0 38 24 62	114 128 270 512	135 150 300 585F
2:15	BRAKE MODIFICATIONS	TBD	5) TBD	26					

FOOTNOTES: TO TABLE I-8

- d Status as of December 1985.
- e With completion of firehardening, add 15 cars on-line (4 A's, 11 B's); 2 new consists (1-10 & 1-5).
- f Assumes 3 B's and 1 A on average will not be in operating fleet while awaiting repair of accident damage.
- g With first set of C-Cars, add 47 cars on-line (41 C's, 6 A's); 26 cars on 3 new consists (2-10's & 1-6) plus 21 cars to other trains.
- h Includes 2 extra 10-car trains required for operation of Daly City Turnback (prior to system resignaling) which do not increase actual capacity during regular peak cycle.
- i 3:10 headway permits addition of 6 consists (5-10's & 1-5) and 8 cars to other consists; 63 cars on new and existing consists (including 2-10's required for Daly City Turnback) plus 17 cars to spares.
- j 2:30 headway permits increase of on-line capacity of 5 consists; 25 additional cars on-line (note: requires further increase in spares of 5 vehicles and assumes requirement for 2 trains in Daly City Turnback is offset through resignaling).

3/21/86

The BART Capacity Expansion Program is designed to meet this need to transport more commuters, especially in the Transbay corridor. As the projects which comprise this program are completed, BART will be able to increase Transbay service capacity in several phases. This phased expansion of capacity is summarized in Table I-8.

To which routes should the extra trains be added? This section outlines and updates the planned allocation of new service increments by route. The Transbay component of existing 43-train service is summarized graphically in Figure I-3. This graph indicates the number and sequencing of trains by route for the P.M. peak train cycle. Figure I-3 represents the baseline against which to compare subsequent service levels.

The future peak load point demand projections by route in the above section were based generally on the planned car and train allocation documented in the 1985 Five Year Plan. The few changes in the planned allocation which now seem warranted were based on updated growth projections by route. In the updated demand analysis, new service car allocation was guided by the same criterion utilized with existing capacity; load factors were balanced across the four routes (except where train length constraints exist). The revised assumptions about incremental capacity increases which are implicit in Table I-4 are discussed in this section.

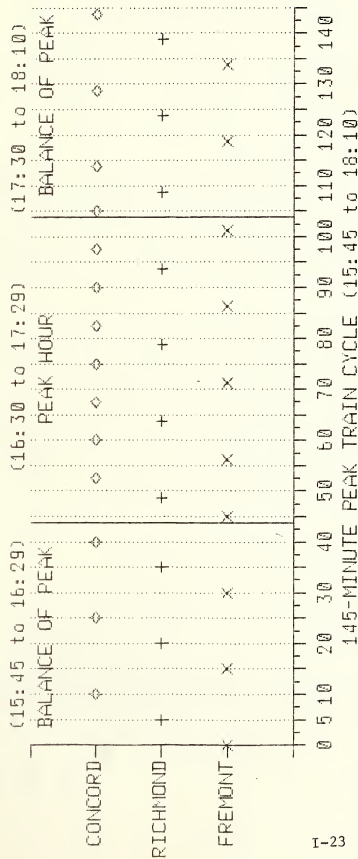
The relationship between peak load point load factors and growth rates by route provides one indicator of where to add capacity. Other factors to consider on a route-by-route basis are the magnitude of current peak ridership, the level of peak load factors (especially on the most crowded trains), the availability of alternative transit services and the level of congestion on parallel freeways.

Other factors to consider in deciding where and when to add new peak period capacity include the total magnitude of peak direction ridership and the degree of maximum crowding (the highest train load factors) by route. During 1985, total peak load point ridership by route was as shown in Table I-9. Ridership on the Concord route exceeds Fremont/Daly City patronage by 45%, Richmond/Daly City trips by 108%, and Richmond/Fremont volume by 274%.

Table I-9			
PEAK PERIOD, PEAK DIRECTION RIDERSHIP BY ROUTE, 1985			
<u>Route</u>	<u>Peak Hour</u>	<u>Balance of Peak Cycle</u>	<u>Total</u>
Concord/Daly City	6,649	5,673	12,322
Fremont/Daly City	4,851	3,650	8,501
Richmond/Daly City	2,903	3,016	5,919
Richmond/Fremont	1,670	1,627	3,297
Total	16,073	13,966	30,039

FIGURE I-3

CURRENT 43-TRAIN SERVICE LEVEL
PM PEAK PERIOD TRANSBAY SEQUENCE
PK HR: 7 CONCORD, 5 FREMONT, 4 RICHMOND



NOTES:

- (1) Sequence starting at 3:45 PM from Embarcadero Station.
- (2) Total of 43 trains on line -- C/DC=14, F/DC=10, R/DC=9, F/RI=10.
- (3) Throughput on R/DC equal to 10 trains due to shorter route miles.
- (4) Minimum headway is 3 minutes 45 seconds.

Maximum train load factors differ significantly by route, as shown in Table I-10. This tabulation indicates the average load factor for the most crowded train on each route during the P.M. peak period in 1985. The load factors reflect actual ridership versus scheduled capacity.

Table I-10

AVERAGE LOAD FACTOR FOR
MOST CROWDED TRAIN ON EACH ROUTE, P.M. PEAK, 1985

Route	Train #	Load Factor
Fremont/Daly City	109	1.78
Concord/Daly City	391	1.45*
Richmond/Daly City	Varies	1.38
Richmond/Fremont	Varies	1.37

*Maximum 10-car consist load factor.

The most crowded train load factor is an index of patron trip scheduling preference or constraint. Over the last several years, the peak has broadened on the Concord route as more riders adjusted their travel schedules in order to take advantage of lower load factors in the balance of the peak cycle. A significant proportion of Fremont/Daly City riders is unwilling or unable to do so. Thus, this route experiences the highest level of crowding on the most heavily loaded train.

Capacity of the bus transit system and the highway network in each corridor should also be considered in allocating future BART peak capacity increases. The Concord route effectively has no parallel bus service, and virtually all highway traffic is constrained to the congested Caldecott Tunnel. The Richmond corridor is facing increased traffic congestion on Interstate 80, and this has reduced the travel time advantage of AC Transit service compared to BART. The corridor stretching south from Oakland to Fremont is served by State Highway 17 and Interstate 580, each of which is less congested than Interstate 80. AC Transit service, especially in the Interstate 580 corridor, is attractive and competitive with BART. Delays affecting traffic approaching the San Francisco-Oakland Bay Bridge are also increasing. This condition is beginning to affect the toll free carpool-bus lane through the Toll Plaza.

PLANNED SERVICE INCREMENTS

All of the above factors have been considered in developing the proposed allocation of future BART service increments among the four routes currently operated. Planned additional trains are indicated by route in Table I-11 together with existing service. The proposed plan calls for a phased increase of 14 trains from the 43 now operated to 57 by FY 89/90. Current plans call for four increments. Planned service increments reflect estimated requirements based on current demand projections. Should these requirements change prior to start-up dates, service increments will be modified accordingly.

Table I-11

DESCRIPTION OF PROPOSED PEAK PERIOD SERVICE

Service Increment	Headways and Trains On-Line							
	FY 86/87		FY 87/88		FY 88/89		FY 89/90	
	Jan-Jun		Oct-Jun		Jan-Jun		Beginning Sep 89	
	First	Second			Thlrld	Fourth: Alternate A	Fourth: Alternate B	
Headways (Min:Sec)								
Minimum Sustainable	3:15	3:05b	3:05	3:05	2:40d	1:40f	1:40g	
Minimum Scheduled	3:45	3:45	3:45	3:45	3:10d	2:30f	2:30f	
Basic Route: Peak*/Midday	15:00	15:00	15:00	15:00	12:40/15:00	10:00/15:00	10:00/15:00	
Trains On-Line, By Route								
Concord/Daily City	7	7	7	7	+1	8	+1	9
Peak 60 Minutes	7	8	+1	9c	+1	10		10
Balance of Peak								
Fremont/Daily City	+1							
Peak 60 Minutes	5	5	+1	6c	+1	7	+2	9
Balance of Peak	5					7		+19
Richmond/Daily City								7
Peak 60 Minutes	4	4	4	4	4	4	+2	6
Balance of Peak	5	5	5	5	5	5		5
Transbay								
Peak 60 Minutes	16	+1	17	17	+2	19	+5	24
Balance of Peak	17	+1	18	20	+2	22		22
Richmond/Fremont								
Peak 60 Minutes	5	5	+1	6	6	6	6	6
Balance of Peak	5	5		5	5	5	5	5
Total								
Peak 60 Minutes	21	+1	22	+1	23	23	+2	30
Balance of Peak	22	+1	23	+2	25	27	+5	30
Total	43	+2	45	+3	48	48	+4	57

First Increment

In the first increment two trains would be added following the completion of the vehicle firehardening program. At that time, 15 additional cars should be available. These cars would be put into service as 5-car and 10-car consists. The 10-car train would be added to the Fremont/Daly City route in the peak hour. The 5-car train would augment Concord/Daly City service in the balance of the peak cycle. These two routes would be expanded in the first service increment because they currently experience the highest average peak load factors and carry the highest volume of riders. This increment should reduce somewhat the crowding on the most heavily loaded train, on the Fremont route.

According to current plans, these service adjustments would be accomplished without significant changes in the current published weekday service timetable. The extra Fremont train would be inserted into the peak hour schedule with minor adjustments to the schedules of the leading and following trains. This addition would take advantage of the system's ability to absorb some schedule compression for a short interval without significant impact on overall train service. On the Concord route, four extra trains now run in 7 1/2-minute headways between the basic 15-minute intervals. The proposed extra Concord train would be scheduled in another 7 1/2-minute slot in the balance of the peak cycle.

Second Increment

The second increment is planned to begin after delivery of the first 48 C-Cars. At the 85% availability objective, this will add 41 C's to service. It is also planned that 6 of the remaining 8 unutilized A-cars would be added. This 47-car increment will provide two new 10-car trains and one 6-car train and 21 cars with which to lengthen existing consists as necessary.

Since no further peak hour Transbay headway reduction is planned as a part of the second increment, the two new 10-car trains will be added to the balance of the peak cycle in much the same way as the first increment Concord train was added. That is, shorter-headway peak hour operation would be extended into the shoulder of the peak. This will entail only minor revision of the published timetable.

According to current plans as shown in Table I-11, a train would be added to two of the three Transbay routes. Each of these trains would be a 10-car consist. In addition, a 6-car consist would be added to peak-hour service on the Richmond/Fremont route. This train would augment capacity in the peak of the peak thereby reducing crowding which now occurs on the smaller, lower-level platform at 12th Street/Oakland City Center Station. This train would be injected into the existing schedule without impacting other trains.

The remaining 21 cars would be used to lengthen consists not at the 10-car limit, as growth requires. The anticipated allocation shown in Table I-11 calls for 8 cars added to Richmond/Daly City peak hour trains, 10 cars to trains on this route in the balance of the peak cycle, and 3 more cars to the Concord/Daly City route.

**SERVICE REQUIREMENTS AND PROJECTED CAR ALLOCATION BY ROUTE
BASED ON ANTICIPATED PM PEAK DEMAND, CAR AVAILABILITY, AND PROPOSED SERVICE EXPANSION**

Service Increment	FY 85/86 ^a		FY 86/87		FY 87/88		FY 88/89		FY 89/90 ^f		FY 90/91	
	Jan-Jun		Jan-Jun		Oct-Jun		Jul-Dec		Sep-Jun			
	First	Second	First	Second	First	Second	Third	Fourth	First	Second	Third	Fourth
Concord/Daly City	70		70	70	70	70	70	+10	80		86	86
Peak 60 Minutes	64	+5	69	+13	82	82	82	+13	95		98	98
Balance of Peak												
Fremont/Daly City	50	+10	60	60	60	60	60	+10	70		77	77
Peak 60 Minutes	38		38	+10	48	48	48	+5	53		56	56
Balance of Peak												
Richmond/Daly City	32		32	+8	40	40	40		40		42	42
Peak 60 Minutes	27		27	+10	37	37	37	+5	42		45	45
Balance of Peak												
Richmond/Fremont	25		25	+6	31	31	31		31		31	31
Peak 60 Minutes	15		15	15	15	15	15		15		15	15
Balance of Peak												
Total On-Line	86	+4	90	+6	96	96	96	+8	104		114	114
A/C-Cars	235	+11	246	+41	287	287	287	+35	322		336	336
B/C-Cars	321	+15	336	+47	383	383	383	+43	426		450	450
Total												
Spares	16		16	16	16	16	16	-2	14		14	14
A/C-Cars	24		24	24	24	24	24	+19	43		48	48
B/C-Cars												
Service Requirements												
A/C-Cars	102	+4	106	+6	112	112	112	+10	122 ^e		128	128
B/C-Cars	259	+11	270	+41	311	311	311	+70	381 ^e		384	384
Total	361	+15	376	+47	423	423	423	+80	503 ^e		512	512
Available Fleet												
A/C-Cars	108		114	155	155	155	155		242		242	242
B-Cars	261		270	270	270	270	270		270		270	270
Total	369		384	425	425	425	425		512		512	512
Surplus (shortage)												
A/C-Cars	6		8	2	2	2	2		9		0	0
B/C-Cars	2		0	0	0	0	0		0		0	0
Total	8		8	2	2	2	2		9		0	0

a. Reflects 43-train service.

b. Reflects 45-train service.

c. Reflects 48-train service.

d. Reflects 52-train service.

e. Includes 20 cars required for operations with Daly City Turnback.

f. Reflects 57-train service.

Third Increment

The third service increment is targeted to follow completion of the five projects shown in Table I-8 as necessary to achieve a minimum scheduled headway of 3 minutes 10 seconds. These 5 projects include PUC approval of fire hardening and removal of the vent separation requirement, delivery of the remaining 102 C-cars, and completion of ICS, the third rail and yard components of the electrification upgrade and the Daly City Turnback.

Current plans call for the addition of six trains and 80 cars in the third increment. Operation of the Daly City Turnback will require two 10-car consists in addition to the normal on-line requirements. These two trains reflect the additional time needed for the Transbay routes to transit the Turnback and, therefore, do not represent an increase in effective capacity. Concurrent with this service increment, the spares requirement will be increased by 17 in recognition of the larger number of trains in service. The net result of the Turnback and increased spares requirements is that on-line capacity will grow by 43 cars and 4 trains, bringing the total trains on-line to 52.

The reduction in the minimum headway to 3 minutes 10 seconds will permit the addition of two trains in peak hour Transbay service. Based on the service expansion factors reviewed above, current plans call for one more peak hour train on each of the Concord and Fremont/Daly City routes. Each would be a 10-car consist. The remaining 23 cars would comprise two additional trains in the balance of the peak cycle, one each on the same two routes, plus additional cars on the Richmond/Daly City route. The general reduction in headways associated with this increment will require revision of the published weekday timetable. The Transbay train service at the 52-train level is illustrated in Figure I-4.

Fourth Increment

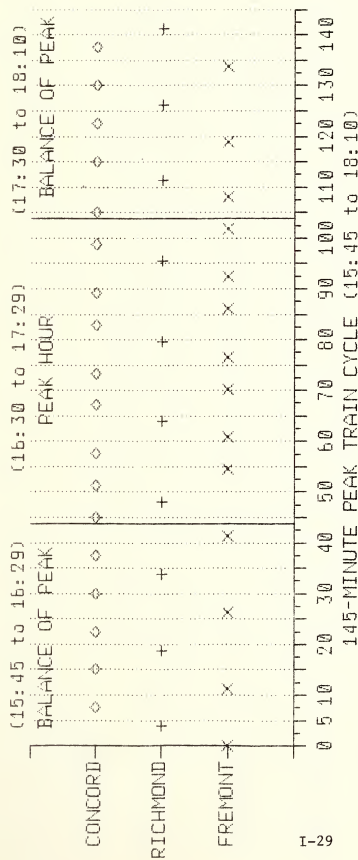
The final increment during the current five-year planning cycle is tentatively anticipated to begin in September 1989. The minimum headway reduction to 2 minutes 30 seconds depends on the capability provided jointly by four projects: retrofit of new on-board ATC into existing A-cars, and completion of the Daly City Yard, the M-87 interlocking and certain modifications called for by the System Performance Study.

Attainment of the 2 minutes-30 second headway capability will allow the scheduling of five more Transbay trains in the peak hour, bringing the total trains on-line to 57. Several options exist for allocating the additional five trains among the three routes. Because of uncertainty about future demand and service requirements, two service options are illustrated in Figures I-5A and I-5B.

Alternative A shown in Figure I-5A features 9 trains each in the peak hour Transbay from Concord and Fremont, and 6 from Richmond. This represents an increase over the third increment of 2 trains each on the Fremont and Richmond routes and one on the Concord route. Peak hour transbay headways would alternate between 5 and 7 1/2 minutes on the Concord and Fremont routes, with

FIGURE I-4

52-TRAIN SERVICE LEVEL PM PEAK PERIOD TRANSBAY SEQUENCE PK HR: 8 CONCORD, 7 FREMONT, 4 RICHMOND

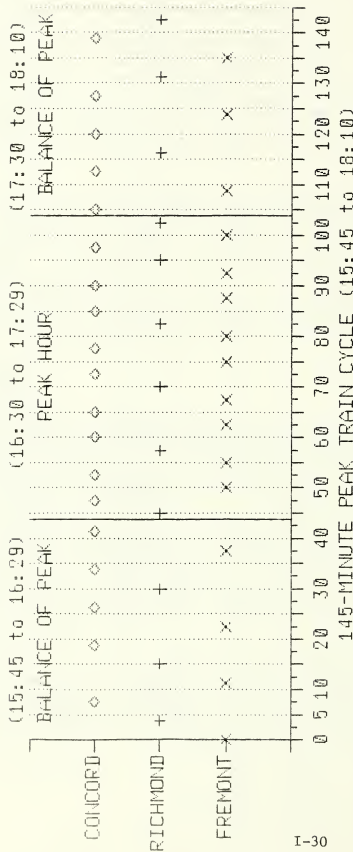


NOTES:

- (1) Sequence starting at 3:45 PM from Embarcadero Station.
- (2) Total of 52-trains on line -- C/DC=18, F/DC=14, R/DC=9, F/RI=11.
- (3) Throughput on R/DC equal to 10 trains due to shorter route miles.
- (4) Minimum headway is 3 minutes 10 seconds.

FIGURE 1-5A

ALTERNATIVE 57-TRAIN SERVICE LEVEL PM PEAK PERIOD TRANSBAY TRAIN SEQUENCE PK HR: 9 CONCORD, 9 FREMONT, 6 RICHMOND

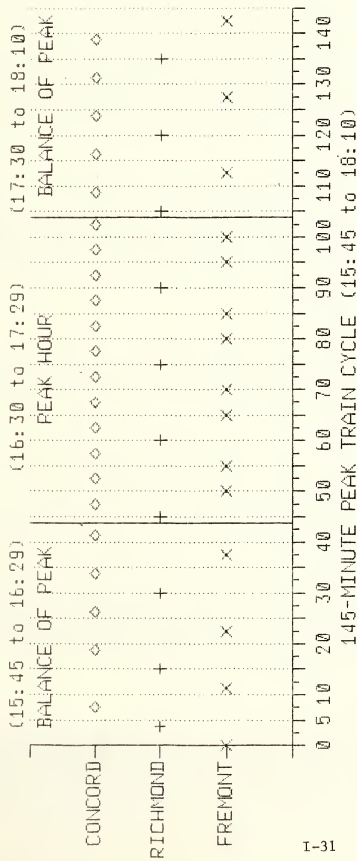


NOTES:

- (1) Sequence starting at 3:45 PM from Embarcadero Station.
- (2) Total of 57 trains on line -- C/DC=19, F/DC=16, R/DC=11, F/RI=11.
- (3) Throughput on R/DC equal to 12 trains due to shorter route miles.
- (4) Minimum headway is 2 minutes 30 seconds.

FIGURE 1-5B

ALTERNATIVE 57-TRAIN SERVICE LEVEL
PM PEAK PERIOD TRANSBAY TRAIN SEQUENCE
PK HR: 12 CONCORD, 8 FREMONT, 4 RICHMOND



NOTES:

- (1) Sequence starting at 3:45 PM from Embarcadero Station.
- (2) Total of 57 trains on line -- C/DC=19, F/DC=11, R/DC=11, F/RI=11.
- (3) Throughput on R/DC equal to 12 trains due to shorter route miles.
- (4) Minimum headway is 2 minutes 30 seconds.

12 1/2-minute Richmond headways. On the A-line, Richmond-Fremont trains would follow Transbay Fremont trains by 2 1/2 minutes.

Alternative B (Figure I-5B) consists of 12 Concord trains, 8 Fremont trains and 4 Richmond trains in the peak hour Transbay. Under this alternative, four of the additional 5 trains would be operated on the Concord route and one on the Fremont route. Headways would be 5 minutes on the Concord route, alternating between 5 and 10 minutes for Fremont and 15 for Richmond.

At this point, neither alternative is clearly preferable to the other from the standpoint of potential demand. The load factor/growth rate model discussed above is probably most accurate in the short run. Some degree of uncertainty exists with regard to projections of demand for one route versus another four to five years from now. For this reason, projections should be updated periodically prior to the targeted start date. A decision regarding the allocation of fourth increment train service should be postponed until the demand picture is clearer and other service considerations have been evaluated.

It is also anticipated that resignaling efforts systemwide will reduce run times enough to offset the two trains required in the third increment for the Daily City Turnback. In effect, Transbay throughput during the peak period will increase by two trains on account of resignaling. Expansion of the number of trains in service will increase the spares requirement by 5 cars. The fourth increment will add 24 cars on-line. Another timetable revision would be forthcoming at this point.

Future Vehicle Requirements

According to current plans, all available vehicles including the C-cars will be in service as of the fourth increment. This is indicated in Tables I-8 and I-12. Expansion of service capacity beyond this level will require the acquisition of additional rolling stock.

The currently planned number of vehicles could be utilized more intensively during the peak hour in the fifth increment when headways can be reduced to 2 minutes 15 seconds. That is, more trains could be scheduled in the peak hour and made up with cars redistributed from the balance of the peak cycle. However, this is probably only a short-term solution, of only marginal benefit. If peak demand growth meets or exceeds the forecast rate, more vehicles will be required.

This condition is not expected to occur within the current five-year plan timeframe, and is thus not pursued in greater depth at this point. However, the issue of buying additional vehicles should be reconsidered with sufficient lead time to bring on extra capacity when needed. The key factors influencing this decision will be the availability of capital funds and the indication of continued strong peak period demand.

Service Increment Summary

The results of the peak period demand projections and the planned service build up in terms of additional cars and trains are summarized in Table I-13. Also shown are projected load factors based on anticipated throughput.

Table I-13

1986 FIVE-YEAR UPDATE: P.M. PEAK PERIOD, PEAK DIRECTION
ACTUAL AND PROJECTED TRAIN SERVICE LEVELS, POINTS
LOAD FACTORS AND PATRONSAGE AT ANALYSIS LOAD POINTS

Peak 60 Minutes	--- CURRENT SERVICE --- Actual	--- 1st INCREMENT --- Add	--- 2nd INCREMENT --- Add	--- 3rd INCREMENT --- Add	--- 4th INCREMENT --- Add	FY 80/81
Concord/Oak City Trains/Cars Lead Factor#	7 / 70 1,45 6,718	7 / 70 1,41 6,551	7 / 70 1,42 6,584	1 / 10 1,34 7,178	8 / 80 1,34 7,459	9 / 86 1,37 7,931
Fremont/Oak City Trains/Cars Lead Factor#	5 / 50 1,50 4,715	1 / 10 6 / 60 5,467	6 / 60 1,45 5,595	1 / 10 1,37 6,290	7 / 70 1,28 6,486	9 / 77 1,34 6,808
Richmond/Oak City Trains/Cars Lead Factor#	4 / 32 1,35 3,910	4 / 32 1,44 3,991	4 / 32 1,18 3,208	4 / 40 1,25 3,405	2 / 2 6 / 42 3,647	6 / 42 1,35 3,892
Subtotal, Transbay Trains/Cars Lead Factor#	16 / 152 1,46 14,341	1 / 10 17 / 162 15,109	8 / 8 15,385	2 / 20 16,873	5 / 15 17,592	24 / 205 18,337
Fremont/Richmond Trains/Cars Lead Factor#	5 / 35 1,15 1,661	5 / 35 1,14 1,607	1 / 6 1,615	6 / 31 0,90 1,663	6 / 31 0,95 1,741	6 / 31 0,98 1,810
Total, Peak Hour Trains/Cars Lead Factor#	21 / 177 1,60 16,002	1 / 10 22 / 187 16,716	1 / 14 23 / 201 17,000	2 / 20 25 / 221 18,556	5 / 15 30 / 326 19,533	30 / 236 1,35 20,441
Balance of Peak Cycle						
Concord/Oak City Trains/Cars Lead Factor#	7 / 64 1,50 5,709	1 / 5 8 / 69 6,063	1 / 13 9 / 82 6,177	1 / 13 10 / 95 7,308	/ 3 10 / 98 8,359	10 / 98 1,56 8,985
Fremont/Oak City Trains/Cars Lead Factor#	5 / 38 1,29 3,679	5 / 38 1,36 3,867	1 / 10 6 / 48 3,995	1 / 5 7 / 53 4,224	/ 3 7 / 56 4,502	7 / 56 1,22 4,805
Richmond/Oak City Trains/Cars Lead Factor#	5 / 27 1,22 3,035	5 / 27 1,35 3,352	5 / 10 5 / 37 3,530	/ 5 5 / 42 3,791	/ 3 5 / 45 4,133	5 / 45 1,25 4,541
Subtotal, Transbay Trains/Cars Lead Factor#	17 / 129 1,28 12,420	1 / 5 18 / 134 13,282	2 / 33 20 / 167 14,006	2 / 23 22 / 190 15,374	/ 9 22 / 199 17,074	22 / 199 1,33 18,431
Fremont/Richmond Trains/Cars Lead Factor#	5 / 15 1,08 1,618	5 / 15 1,07 1,600	5 / 15 1,09 1,629	5 / 15 1,08 1,645	5 / 15 1,10 1,665	5 / 15 1,11 1,686
Total, Balance of Peak Trains/Cars Lead Factor#	22 / 184 1,25 14,038	1 / 5 23 / 149 14,882	2 / 33 27 / 182 15,635	2 / 23 27 / 205 16,943	/ 9 27 / 214 18,719	27 / 215 1,31 20,097
Total, Peak Period Trains/Cars Lead Factor#	43 / 321 1,54 30,040	2 / 15 45 / 336 31,358	5 / 47 48 / 383 32,635	4 / 43 52 / 426 35,479	5 / 24 57 / 450 38,052	57 / 450 1,56 40,538

* Scheduled Capacity

Based on Projected Throughput

If demand by route grows in accordance with the projections and new capacity is allocated as proposed, the planned service should be reasonably well balanced by FY 90/91 in terms of average load factors. During the peak hour, load factors on the three Transbay routes are projected to be virtually identical.

As noted above, all vehicles are assumed to be in service by FY 90/91. If patronage response to the initial service increments is as projected, and overall demand is growing, plans to acquire additional vehicles will need to be re-examined. This consideration should be monitored annually.

SERVICE QUALITY

Although provision of adequate capacity has become the District's top priority, this emphasis in BART policy does not mean that reliability can be taken for granted. Indeed, improved service quality was largely responsible for attracting and maintaining the addition to BART patronage experienced during recent years (see Table I-14 on page I-35). Continued growth of BART ridership will depend heavily on the extent to which service quality can be maintained and improved. The issue of service quality addresses system performance and its impact on patronage. Research in this area of transit performance indicates that ridership tends to be more responsive towards changes in service quality than in fares. BART patronage growth since October 1980 supports this finding. A decline in service measures during the July-September 1985 quarter because of construction activities at Daly City and on the KE track was accompanied by below forecast patronage.

Because scheduling more trains on the system will alter the current operating environment, it will be essential to maintain system reliability while implementing capacity improvements. Work completed as a part of the System Performance Study has contributed to the identification of achievable capacity objectives in the context of current high reliability standards.

Many improvements in system performance were produced by the Reliability Improvement Program. Results of this effort are best exemplified by increased on-time performance, improved car and train throughput, and reduced incident rates for passenger offloads, AFC equipment, and train removals.

Earlier improvements in operating dependability supported BART's decision in 1978 to publish a train schedule for both evening and weekend service. Daytime weekday train performance improvements as reflected by a 95% on-time record justified publication of a similar schedule for weekday operations in April 1983. This timetable constitutes a more stringent basis for assessing service quality which is available to all patrons and other interested persons. Maintenance of high quality service will be increasingly challenging, especially as BART commences its service expansion program.

COST EFFECTIVENESS AND PRODUCTIVITY

Cost effectiveness and productivity are integral to overall financial performance and the economies of providing expanded levels of service.

OPERATING PERFORMANCE AND RELIABILITY COMPARISON

REVENUE SERVICE PARAMETERS	JULY 1976	JUL-SEP 80 ¹	JUL-SEP 82 ¹	JUL-SEP 84 ¹	JUL-SEP 85 ¹
Total Ridership	2,771,533	3,827,172	4,587,320	5,065,032	5,217,334
Number of trains scheduled during peak service hours	33	44	42	43	43
Car Availability at 8 AM (Percent)	61%	83%	88%	90%	87%
Percent of scheduled runs completed	90%	96%	99%	99%	99%
Percent of train runs "On Time"	46%	85%	94%	95%	92%
Revenue car hours	57,707	83,699	90,554	93,367	95,565
Total revenue & nonrevenue vehicle equipment failures (per 1,000 car-hours)	20.2	11.1	11.5	11.1	
Vehicle equipment caused unscheduled train removals (per 1,000 car-hours)	5.4	2.6	1.4	1.5	
Total offloads (per 1,000 car-hours)	2.4	1.6	1.2	1.6	2.1
Automatic fare collection incidents (per 1,000 passenger trips)	0.652	0.52	0.34	0.30	0.33
Percent of scheduled peak period, peak direction, Transbay throughput:					
Train:	N/A	N/A	98%	98%	97%
Cars:	N/A	N/A	97%	97%	96%
Farebox ratio	39% ³	45%	47%	48%	44%
Operating ratio	42% ³	51%	51%	54%	50%
Annual miles per car: BART average	N/A	75,000	75,000	73,000	74,000
Industry average	N/A	50,000	50,000	50,000	N/A
Vehicle related maintenance headcount	425	360	360	360	360

1. Monthly average for 3-month period

2. Data for 1977.

3. Ratios are for FY 1975/76.

Favorable performance in these, as well as for other areas, is directly dependent upon management's ability to formulate and implement effective programs which can keep pace with inflation. Recent trends for District financial performance indicate that this has in fact occurred, where stringent budget controls and above forecast revenues, in large part due to better service, have produced better than anticipated results. In real terms, BART costs per passenger, and per vehicle mile have declined over the past six and one-half years, as shown by the constant dollar comparisons in Figures I-6 and I-7. At the same time, BART patronage and vehicle miles per equivalent employee have risen. This is solid evidence of BART productivity. Additional gains in the future will be harder to attain, thus management efforts should be focused on strategies to hold the line on expense, and to evaluate new ways of allocating resources.

Future operating budget considerations will be examined. However, several factors first need to be recognized in the general context of financial effectiveness.

Staffing costs comprise the largest component of total operating expense. While this may decline somewhat if electrical energy assumes a larger proportion, staffing cost is the one factor most directly under District control. Staffing levels materially affect labor cost, and to the extent that output can be increased without proportional increases in staffing, future labor cost increases can be held within the limits of available resources.

Secondly, since available information suggests that electrical energy cost increases will rise faster than all other cost components, District efforts will need to focus on developing operating strategies which can lead towards reduced levels of power consumption (i.e., reduced car miles), consistent with stated load factor objectives, and on potential alternative sources of electrical energy.

Finally, the planned streamlining of the BART Express Bus service should be continued as planned. This component of expense has increased in recent years, and its farebox ratio is well below the standard set for overall District operations.

On the funding side, increasing transit operator demands for regionally allocated discretionary funds are expected to limit BART's share of these resources. Additionally, capital funding limitations will require BART to continue to generate a portion of its capital funding requirements through operating sources in order to provide for essential system replacements and improvements. These limitations are expected to become more severe as competition for decreasing federal capital funds becomes more intense.

Continued pressure on the District's financial resources will further emphasize the need for efficient and effective operating strategies which incorporate innovative productivity measures into the overall approach. Further, key capital improvements which can enhance current operational efficiencies will need to be completed in order to realize long-term economies and increased productivity. Both the Daly City Turnback and Yard and the new C-cars will produce significant operational benefits and resulting cost

FIGURE 1-6

PATRONAGE AND COST COMPARISON

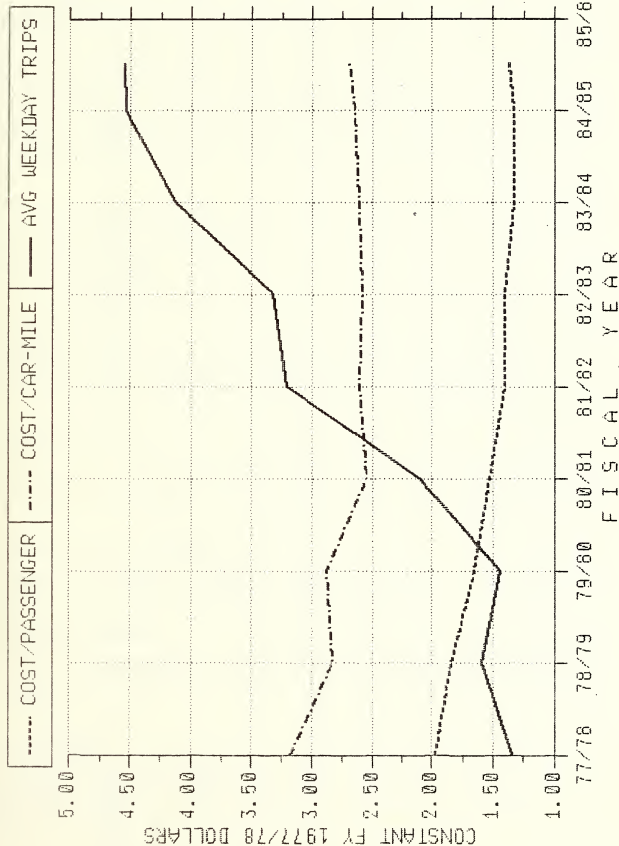
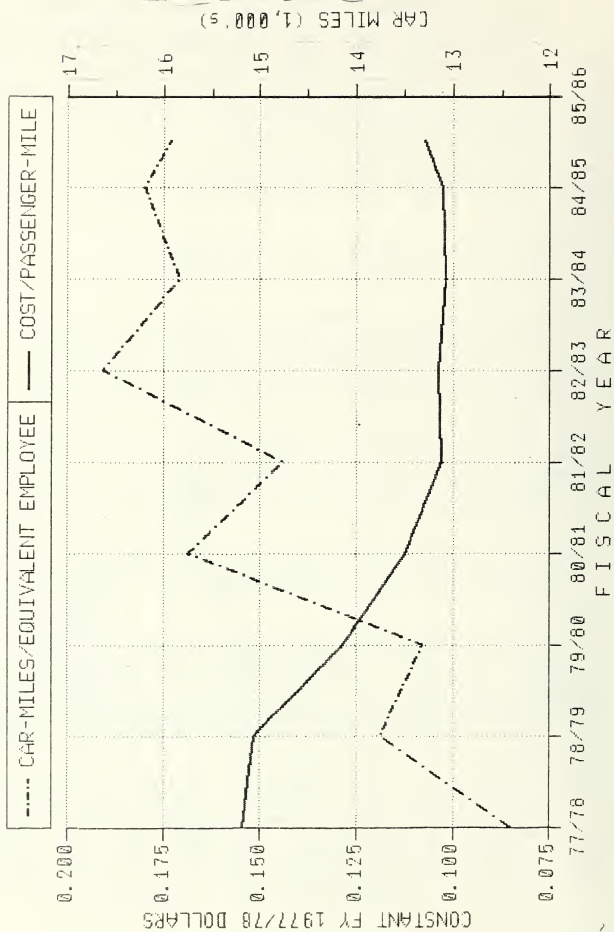


FIGURE I-7
SERVICE OUTPUT & COST COMPARISON



savings. In the future, BART must exploit every possible operating efficiency in order to reduce cost pressures and minimize the size of necessary fare increases.

PROGRAM DELIVERY

Realizing BART's inherent economies of scale and latent capacity potential by the end of this planning period is a realistic but challenging objective. Based on the projections noted above, it seems reasonable to expect significant growth in ridership if capacity increases can be delivered in a timely manner. These capacity increases depend heavily on implementation of the District's Capital Improvement Program. The principal elements of the capital program have been well established for several years and include:

KE Track

The third downtown Oakland track (KE track) is required to increase capacity through the heavily travelled Oakland wye, where all four routes merge. This project was completed in December 1985 and operations utilizing this track commenced in March 1986.

Vehicle Fire Hardening

The currently imposed CPUC subway vent separation requirement effectively limits scheduled San Francisco line headways to 3 minutes 30 seconds, or 17 trains per hour. The removal of this restriction is contingent upon the completion of the vehicle fire-hardening program.

New Revenue Vehicles

One hundred fifty new revenue vehicles are needed to service anticipated patronage growth. The new C-car will permit expansion of existing consists which are less than 10 cars long, addition of new trains, as well as efficient on-line sizing of trains.

Central Train Control Computer

A new central train control computer will be required for operations exceeding the existing computer capacity limit of 49 on-line trains.

Electrification Upgrade

Operation of increased numbers of peak period trains at reduced headways will require additional power distribution facilities on the C-Line and in all three yards.

Daly City Turnback

Higher density train operations will require a more efficient and less time consuming train reversing facility at Daly City, where the minimum scheduled turnback time is now 3 minutes 30 seconds (versus a required minimum of 2 minutes 15 seconds).

New Vehicle Automatic Train Control System (ATC)

The existing ATC units on all A-cars represent the largest single cause of vehicle service disrupting failures on the system. The New Vehicle ATC system will substantially reduce ATC caused service disrupting failures. This system will be installed in all C-cars and will also be retrofitted into all existing A-cars.

Daly City Yard

A westbay storage facility will be needed to lay up vehicles not needed for midday operations. Layups at this yard will produce significant savings in power and vehicle maintenance costs. Shop facilities are also under construction which could provide essential support to the new yard and in maintaining lower headways.

M-87 Interlocking

Relocation of the turnout to track 3 at Daly City Station is needed to eliminate interference between a train berthing on that track and one being dispatched from track 1.

Wayside Train Control/System Performance Modifications

The System Performance Study determined that a number of improvements will be necessary, in addition to those listed immediately above, to achieve BART's five-year capacity objectives while maintaining or enhancing service quality. This program will include the following key tasks:

- o Reconfiguration of track circuits by moving and adding blocks,
- o Resignaling of some parts of the system,
- o Modification of station approach markers,
- o Modification of SORS software to reduce time to initialize (reset) this system,
- o Enhancement of central computer control capabilities
- o Development of a delay reduction program
- o Enhancement of train operations simulation capability

Further, in order to attain the 2 1/4-minute headway objective, it will be necessary to analyze and develop brake rate modifications and seek approval by the CPUC.

Attainment of the increased capacity potential inherent in the BART system with the completion of these projects depends upon their joint implementation. Lacking one or more of these major components, the system will not be capable of performing at the required higher level of capacity.

Estimated completion dates for these projects are highlighted in Figure I-2 above. The service expansion scenario described above depends completely on realization of these capacity enhancements as scheduled. Timely funding and effective project management are therefore essential to assure the delivery of these important capital improvements as scheduled.

EXTENSIONS

Extensions to the 71-mile basic system were thoroughly reviewed in the "New Starts and Extensions" hearings held by the Metropolitan Transportation Commission (MTC) in FY 1983/84 for the purpose of prioritizing these and other regional projects for future implementation. The resulting MTC New Starts and Extensions Program supports the four BART extensions which are in Phase I (Within Current Three-County District Priority) of the BART Extension Policy.

Acquisition of purchasable extension station sites is in progress. Interim usage of these acquired future rail station sites is being coordinated with the District's planned improvements to the Express Bus program to provide freeway-oriented, park/ride lots for Express Bus service.

MAINTENANCE REQUIREMENTS

In late 1976, BART implemented a new Maintenance and Engineering philosophy from which a new Maintenance Plan evolved. Basically, for the three maintenance divisions within the department, Engineering sets the criteria, Maintenance performs the work using Engineering provided documents, and Inspection, at predetermined times, ensures that Maintenance is performing to Engineering criteria. There is no appeal beyond Engineering. This tried and proven philosophy will remain in effect now and in the future.

A description of District maintenance departments, personnel, facilities, and a summary of BART's maintenance program are included in Appendix A.

EXPRESS BUS EFFECTIVENESS AND PRODUCTIVITY

Concern about the cost, relatively low farebox recovery ratio, and local service nature of BART Express Bus Service led to a major reevaluation of this program. Efforts to upgrade the program began with the drafting of a revised scope of services which formed the basis for an amended contract signed during FY 1984/85. On-time performance standards and a farebox revenue objective were established. The reevaluation of service has sought to identify opportunities for reduction of scheduled travel times by shifting to more freeway-oriented operations.

ENERGY CONTINGENCY REQUIREMENTS

Although gasoline supplies are currently more than adequate given the worldwide oil glut, energy contingency concerns should not be ignored. In the event of a significant gasoline shortage which would potentially divert large

numbers of automobile commuters to the system, BART will not be able to expand peak period service until the new revenue vehicles now on order are delivered. All available BART rail vehicles are currently in service. A few additional vehicles will become available when the fire hardening program is completed by January 1987, but significant capacity expansion will not occur until September 1988 with the reduction in Transbay headways to 3 minutes 10 seconds.

In view of this inability to expand capacity significantly until 1988, BART's response to a gasoline shortage will of necessity be comprised of the following types of activities:

- o Extension of peak period service beyond the current transition to offpeak service to accommodate commuters who can shift their normal working hours;
- o Provision of information about train loading patterns especially with reference to space available in non-peak directions for reverse commuting;
- o Potential consideration of higher peak period fares to shift non-essential trips to offpeak periods.

Each of these responses to a gasoline shortage condition could be implemented within a fairly short time interval. Energy contingency concerns are discussed further in Chapter II (see page II-45).

CAPITAL INVESTMENT PLANNING

For the past several years, BART has recognized the need to implement capacity expansion projects which will augment the inherent capability of the present system to transport commuters into the congested Central Business Districts of San Francisco and Oakland. This need to develop and finance a number of major capacity expansion projects has entailed a comprehensive capital investment planning effort. This work involves a determination of needs and/or problems to be resolved, identification of alternatives and evaluation of potential solutions. After selection of appropriate projects, funding strategies are developed to maximize state and local financial resources. Capital investment planning, following these guidelines, is an integral part of BART Short Range Transit Planning.

PRIVATIZATION

Although BART is a public agency, a considerable amount of its operating budget is spent on contracted provision of goods and services, mainly through private firms. There is growing recognition that private providers may have an important role in support of transit operations, especially as public financial support is diminished. Pressure on future operating budgets will require that alternative sources of goods and services be considered. BART has already identified possible opportunities for private providers of selected feeder and/or Express Bus service and has established a notification process to ensure that such opportunities are communicated to private providers.

In addition, BART seeks to participate actively with the private sector in a joint development program as a means of financing access improvements (see pages II-47 to II-50).

In response to more definitive federal guidelines on privatization, BART has prepared detailed documentation of its efforts to date in this regard. This information has been transmitted to the Urban Mass Transportation Administration (UMTA) in support of current grant applications, and is contained herein in Appendix E.

Additionally, BART has developed a draft schedule for conducting an "analysis of existing public services to determine if such services can be provided by private operators." This schedule and related information are also contained in Appendix E.

DISADVANTAGED AND WOMEN BUSINESS ENTERPRISE

All sectors of the economy merit an equal opportunity to participate in publicly financed endeavors. BART has specifically recognized this concern in setting its annually adopted performance objectives. BART's performance through FY 1984/85 has approximated or exceeded the District's goals, and District management recognizes the need to maintain a strong resolve to provide an affirmative action contract environment.

SHORT RANGE TRANSIT PLANNING

BART was in the vanguard of transit systems which developed management-by-objectives processes, systematic performance monitoring and short-range planning efforts. This corporate philosophy continues to guide District management and policy makers. The District Quarterly Performance Report on System Objectives is keyed to the Program Area outline which structures the BART Short Range Transit Plan. In other words, the objectives which are developed in the planning process form a detailed checklist by which management performance is routinely monitored and publicly communicated to all interested persons. BART considers this process essential to sound management and effective delivery of responsive transit service.

The BART Short Range Plan includes an analysis of key factors which affect the management and operation of the system. Service planning is a major focus of this plan, as is the development of 5-year financial forecasts. Periodic fare structure adjustments are necessary to keep pace with inflation and provide new services as appropriate. In this regard, the planning process is essential to determine the magnitude of equitable fare increases necessary for the attainment of incremental revenue targets.

The BART Short Range Transit Plan also addresses improved efficiency of operation through the Productivity Improvement Program, and monitors Elderly and Handicapped services through the BART Access Program.

CHAPTER II

OPERATIONS AND CAPITAL
IMPROVEMENT PROGRAM

The preceding chapter outlined general considerations for this year's Short Range Transit Plan update. Future demand expectations were reassessed, highlighting the need for adequate capacity without compromising service quality. Important issues including cost effectiveness, productivity, and program delivery were also identified. The purpose of this chapter is to review recent District performance and to examine the outlook for the future.

The following discussion is presented by program area: the nine areas of District activity which respond to the Board adopted goals (see page 2-3). Following general introductory remarks which highlight past performance, the discussion is divided into four major sections within each program area. These are:

FY 1985/86 OBJECTIVE STATUS

A review of District performance for the first half of FY 1985/86 with respect to each of the Board adopted program area objectives.

FUTURE OUTLOOK

Based on an analysis of recent data and trends, an assessment of likely year-end performance is presented relative to each objective. Additional discussion focuses on likely performance beyond June 1986 and within the current 5-year planning horizon.

PLANNED IMPROVEMENTS

This section presents BART's strategy for assuring continued favorable performance. Specific projects and programs are highlighted in terms of future considerations.

PROGRAM AREA OBJECTIVES

The fourth and final section identifies revised program area objectives for the upcoming 1986/87 fiscal year and also for the four remaining years in the current planning timeframe. For detailed information on each project, see Appendix D.

Additionally, Figure II- which follows the program area discussion (beginning on page II- , identifies all priority capital projects and summarizes each project's justification and implementation schedule.

PROGRAM AREA A: BASIC SYSTEM SERVICE AND CAPACITY

Provision of adequate capacity continues to be the main thrust of District planning efforts, given over a decade of strong growth of demand and projected increases. The last major capacity addition was introduced with the phasing of close headways service during the summer of 1980, from 3- to 4-route Transbay service (with the addition of the Richmond/Daly City route). This improvement increased peak period on-line trains from 33 to 42, and on-line cars from 272 to 310. While scheduled peak hour Transbay capacity is 55% greater today, the growth in demand since 1980 kept peak hour train load factors virtually unchanged (1.40 then versus 1.34 presently). And with all available B-cars currently being used, higher load factors and constrained ridership levels are clearly part of BART's future until additional capacity can be provided.

FY 1985/86 OBJECTIVE STATUS

The phased implementation of the KE Track and Daly City Turnback required close coordination of construction work for these two projects with scheduled revenue service. Starting July 8, 1985, train control work performed on the KE track between MacArthur and 19th Street stations required all trains on this segment to be manually operated at reduced speeds. Except for night and Sunday service, all scheduled Richmond and Concord train departures were moved up two minutes for the duration of this work in order to maintain scheduled arrival times at downtown Oakland and San Francisco stations. KE track work completed in late December 1985 allowed for the reinstatement of automatic train operations between MacArthur and 19th Street stations in March 1986.

Beginning August 8, 1985, construction of the Daly City Turnback required that one of the three station platforms at Daly City be removed from service on an alternating basis. This project phase is currently scheduled to be completed during the third quarter this fiscal year. As an interim measure, overhead signal lights have been installed to direct passengers to in-service platforms. In order to maintain scheduled service, train reversing at the two in-service platforms requires all Daly City dispatches to be advanced 30 seconds (only for four-route service on weekdays).

Objective status with respect to key train performance measures for Basic System Service and Capacity and Reliability reflect the impact of this construction on revenue service.

As summarized in Table II-1 on page II-3, weekday service now calls for 43 on-line trains during peak periods, 39 for midday operations, and 14 for 2-route night service. Similarly, scheduled weekend service remains unchanged this year with 31 on-line trains required for Saturday daytime service and 14 on-line trains for Saturday night and all day Sunday service.

As of December 1985, BART's operating fleet consisted of 128 A's and 290 B's. Four a.m. pre-peak car availability averaged 104 A-cars and 258 B-cars for the July-December 6-month period (versus 102 and 261 A- and B-car availability objectives for the same period). This actual availability compares to service requirements (for afternoon peak period operations during December) of 102 A-cars and 259 B-cars and represents 81% and 89% of the operating A- and B-car fleet, respectively.

Actual peak period Transbay capacity averaged 97.0% of scheduled trains and 95.1% of scheduled cars. This is below BART's throughput objectives of 98.0% for trains and 97.5% for cars.

Based on representative data, systemwide load factors for the first half of FY 1985/86 averaged 1.40 for peak hour operations, 1.23 for the balance of the peak period, and 0.75 for offpeak service (versus an objective which calls for all maximum offpeak train load factors to average no greater than 1.05). These load factor averages, however, do not reveal the rather wide range of values recorded for individual routes. Peak hour load factors ranged from a high of 1.51 on the Fremont/Daly City route to a low of 1.20 on the Richmond/Fremont route, and individual train load factors were even higher. The current District objective for peak period operations calls for balancing load factors for discretionary trains (consists which can be lengthened or shortened within the 3- to 10-car limitation). For discretionary trains, peak period load factors for the July-December period averaged 1.23 for Concord/Daly City, 1.22 for Richmond/Daly City, 1.21 for Fremont/Daly City, and 1.17 for Fremont/Richmond. The discretionary train load factor objective was attained since any shifting of cars off the Fremont/Richmond

Table II-

SCHEDULED SYSTEM CAPACITY (As of December 1985)

	C O M M U T E			W E E K D A Y		S A T U R D A Y ^a		S U N D A Y / H O L I D A Y	
	AM PEAK	MIDDAY	PM PEAK	NIGHT ^a	DAY	NIGHT	DAY	NIGHT	
NUMBER OF TRAINS									
Concord/Daly City	14	10	14	7	8	7	7	7	
Fremont/Daly City	10	10	10	b	8	b	b	b	
Richmond/Daly City	9	9	9	b	7	b	b	b	
Fremont/Richmond	10	10	10	7	8	7	7	7	
Total On-Line	43	39	43	14	31	14	14	14	
Spares	8	7	8	7	c	c	c	c	
Total Required	51	46	51	21	c	c	c	c	
NUMBER OF A-CARS									
Concord/Daly City	28	20	28	14	16	14	14	14	
Fremont/Daly City	20	20	20	b	16	b	b	b	
Richmond/Daly City	18	18	18	b	14	b	b	b	
Fremont/Richmond	20	20	20	14	16	14	14	14	
Total On-Line	86	78	86	28	62	28	28	28	
Spares	16	14	16	14	c	c	c	c	
Total Required	102	92	102	42	c	c	c	c	
NUMBER OF B-CARS									
Concord/Daly City	106	32	106	40	20	16	40	11	
Fremont/Daly City	69	22	65	b	19	b	b	b	
Richmond/Daly City	42	15	44	b	14	b	b	b	
Fremont/Richmond	18	10	20	8	8	7	11	7	
Total On-Line	235	79	235	48	61	23	51	18	
Spares	24	8	24	12	c	c	c	c	
Total Required	259	87	259	60	c	c	c	c	

a. Base service requirement without consideration of major special events which may require additional capacity.

b. No service on these routes during these times.

c. Spare requirements are a yard option for weekend service.
A minimum of one train per yard is kept as a ready spare.

route would have resulted in excessively high load factors on the resulting shorter trains. The offpeak objective was virtually achieved: offpeak load factors on only one of 39 offpeak trains exceeded the 1.05 target during the July-September 1985 quarter.

FUTURE OUTLOOK

Despite the construction impact of the KE Track and Daly City Turnback, it appears that all of the objectives for this program area will be achieved this fiscal year. This is predicated on recovery of performance during the second half of the year with the completion of the KE Track and the current construction phase of the Daly City Turnback in March 1986 (and subsequent return to 3-platform service from Daly City Station).

Increased ridership over the last decade has placed a premium on peak hour capacity to the point that load factors for the balance of the peak period have gradually increased. This has resulted as new riders able to modify their work schedule, take advantage of less crowded train conditions just before and after the peak hour. The future outlook for reduced crowding (and the ability to accommodate higher patronage at desired load factors) will require additional peak period capacity which can only be provided by additional cars and an increase in the number of on-line trains. The system is effectively functioning at maximum service levels presently, with no major capacity additions possible until the following limitations are resolved:

Removal of Subway Vent Separation Requirement

As a result of the January 1979 Transbay tube fire and subsequent investigation, BART is restricted to operating no more than one train between any two subway air vents. This is a precautionary measure imposed to minimize the risk of smoke from a train being drawn past other trains. The removal of this restriction is dependent upon completion of the vehicle fire-hardening program and approval from the California Public Utilities Commission (PUC).

Additional Cars

Even if BART could operate at closer headways, the current car inventory of 136 A's and 303 B's would not permit scheduling additional capacity. The vehicle fire-hardening program (see Program Area C: Safety and Security, on page II-17 requires the removal of 5 A's and 11 B's until this project is completed in October 1986. This means the District will have a maximum of 109 A-cars and 261 B-cars to form online and ready spare trains (under current headway capabilities, however, only 102 A's can be used). Additional cars will be required, both to lengthen currently scheduled trains where possible and also to make up additional trains once headways can be reduced.

Central Train Control Computer

BART's existing train control computer is limited to supervising a maximum of 49 on-line trains and is approaching the end of its useful life. With future operations requiring up to 75 on-line trains at 2 minute 15 second headway operation and more for system extensions, a new system capable of handling substantially more traffic

will be required.

Insufficient Power Distribution Facilities

Planned future service levels will exceed the capacity of current power distribution facilities on the C-Line and in the three yards. Upgrades of these facilities are essential.

Terminal/Turnback Zone Configuration and Approach Speeds

With the exception of the Richmond terminal zone, those located at Concord, Fremont, and Daly City require trains to cross in front of one another in negotiating inbound and outbound movements. This, together with excessively slow speeds (as low as 3 miles per hour), increases the time required for reversing trains at the ends of each line. This is most critical at Daly City since this is the turnback point for the three Transbay routes and therefore reflects the highest service frequency on the system. Until recently, turnback parameters have limited operations to a 3 minute 45 second headway which resulted in the current schedule of 16 trains per hour reversed at Daly City. A 3 minute 30 second-headway is now possible based on train control modifications to the existing track in the vicinity of Daly City completed last year which permit scheduling one additional train in the peak hour. Full utilization of this capability must await delivery of additional revenue vehicles. To reduce headways further will require a more efficient track configuration and signal protection to allow for improved train reversing.

A-Car Automatic Train Control System (ATC)

The ATC units on BART A-cars operate at an unacceptable reliability rate. The current ATC system comprises the principal cause of service disrupting failures of the BART vehicle. A headway of 2 minutes 30 seconds will not be possible using current ATC units. Second generation ATC units developed for the C-car will have an improvement of 25 to 1 and will replace current A-car ATC units.

Primary Train Detection

Uncertainty prior to the beginning of BART service about the primary train detection system's ability to recognize continuously all online trains led to the CPUC requirement for backup detection systems. The Computer Assisted Block System (CABS) was used initially. This was replaced by the backup system currently in effect, Sequential Occupancy Release System (SORS), which provides adequate detection but compromises the ability to operate trains on headways less than 3 minutes 30 seconds. Completion of the System Performance Study reveals that reconfiguration of the track detection circuits, resignalling, and modification of SORS software along with other enhancements will be needed to allow headways of 2 minutes 30 seconds.

Brake Rate Modifications

Another finding of the System Performance Study is that, to achieve the ultimate goal of 2 minute 15 second headways, some relaxation of braking parameters in signalling will be required, either by raising the signalling brake rate or reduction of other brake delay assumptions. This will involve safety studies and a request to the CPUC.

PLANNED IMPROVEMENTS

A description of proposed peak period service for the next five years is presented on page I-25, with peak period service defined by the number of trains on line by route

and resulting headways in minutes. Current peak period service is shown as 43 on-line trains. With one exception, this essentially represents the maximum level of peak period capacity which can be provided between now and the end of 1986 when the phased delivery of the new C-cars begins to have a significant impact on the size of BART's vehicle fleet. Obviously, this will have a bearing on system load factors given the foregoing demand projections.

The exception noted above refers to the addition of 2 new peak period trains beginning in January 1987. These trains will consist of cars which become available upon completion of the fire-hardening project in October 1986. As a result of Fremont/Daly City having the highest average load factor during the peak hours, one train during this time period is to be added on this route. The second new train will be added to Concord/Daly City service just outside the peak hour, by extending the 7 minute 30 second-route headway further into the balance of the peak period.

The next significant addition of on-line capacity is scheduled to occur during the latter half of 1987, when expansion of peak period service to 48 trains will be possible with the receipt of 48 C-cars by July 1987.

The reduction of the minimum scheduled headway to 3 minutes 10 seconds and the start of 54-train service will be possible by September 1988 after: the completion of the turnback portion of the Daly City project by December 1987, the completion of vehicle fire hardening (providing the basis for CPUC removal of the vent separation requirement which is scheduled to take place by October 1987), central train control computer enhancement by December 1987, minor modifications covered under the electrification upgrade project, and the delivery of the balance of the new revenue vehicles by July 1988.

Completion of the new on-board ATC units on all A-cars by November 1987, the Daly City Yard by March 1988, the M-87 Interlocking by July 1988, and other improvements identified by the System Performance Study by July 1989, are expected to result in a further reduction of the minimum scheduled headway to 2 minutes 30 seconds and resulting expansion of on-line trains to 57. The changes recommended by the System Performance Study (beyond those improvements already described) relate to changes affecting wayside train control, and include: reconfiguration of track circuits, resignalling of portions of the system, modification of station approach markers, modification of SORS software, and enhancement of central computer control capabilities. Although schedules have been developed for implementing these changes prior to the September 1989 target date assumed in Table I-3, this effort will be complex and difficult to implement in conjunction with the remaining BART capacity expansion program, and funding of the whole project is not yet assured.

The next service level anticipated after September 1989 is a decrease in the scheduled minimum headway from 2 minutes 30 seconds to 2 minutes 15 seconds. This will require a change in the braking algorithm used for signalling and, ultimately, CPUC approval.

In order to implement the proposed service expansion scenario, several major projects must be completed. District efforts will, therefore, continue to focus on the timely implementation of already programmed essential capital projects which, when completed, will permit an 85% expansion of BART capacity as outlined above. In summary, these essential projects are:

Vehicle Fire-Hardening

As a result of the January 1979 Transbay Tube Fire and subsequent investigation, BART is restricted to operating no more than one train between any two subway air vents per direction at any given time. This is a precautionary measure imposed to minimize

the risk of smoke from a train being drawn past other trains. The removal of this restriction is anticipated following the completion of the District's fire-hardening program which is scheduled for completion by October 1986. Under this program, all vehicle wall and ceiling liners and floors are being reconstructed to reduce flammability and toxic smoke emissions. Until this project is completed, widely spaced vents located in the Berkeley Hills Tunnel and on the San Francisco line between Civic Center and 16th Street stations limit headways to approximately 3 minutes 30 seconds in San Francisco and 4 minutes 30 seconds on the Concord line.

New Revenue Vehicles (C-Cars)

The analysis of BART capacity requirements on page I-17 through I-24 indicates that additional vehicles are vitally necessary to meet projected ridership growth during the five-year planning period. As indicated, peak period service capacity cannot be significantly expanded until receipt of the new C-cars. To maintain maximum capacity, 85% A- and C-car and 90% B-car availability will be required along with train and car throughput of 93.0% and 97.5% respectively. Without the new C-cars, forecast patronage, if attained, will exceed system capacity, with load factors well above desired standards.

Enhanced Central Train Computer

The central train computer in conjunction with various supporting wayside equipment provides systemwide train supervision. The existing central computer is capable of monitoring the movement of up to 49 trains at any one time. Expansion of central control capabilities is needed to allow for on-line train operations exceeding this by the latter half of 1988. Current plans call for the second phase enhancement of the existing system to be operational by late 1987. Once in place, the integrated control system (ICS) will allow BART to operate 75 on-line trains initially, with the capability of expanding the control system for operating 115 trains.

Electrical Capacity Increase

This project is designed to upgrade third rail power distribution. This will involve the installation of 2 new substations, 3 breaker stations, modification and upgrade of existing yard substations, third rail modifications and increase of yard feeder cable capacity. These improvements are planned for the C-line segment of the mainline and for all three yards, especially the Concord Yard.

Studies by DeLeuw Cather and BART staff have determined that mainline equipment will support operation up to the 50-train level, however, voltage problems will exist on the C-line at the planned five-year service level. Yard equipment will support operation up to the 50-train level, but some equipment will be overloaded at the five-year service level.

Daly City Turnback/Storage Facility

Once currently scheduled consists reach the 10-car limitation, more on-line trains will be required to increase capacity. This need already exists on the Concord and Fremont/Daly City lines during peak hours with maximum available capacity essentially

being provided and load factors continuing to increase as a result of persistent peak period patronage growth despite overcrowding. Due to current system constraints which limit minimum sustainable headways to 3 minutes 30 seconds, only one additional peak hour train can be operated until essential improvements are in place. The Daly City turnback is a critical element required for reducing headways significantly below current levels since it will provide a much more efficient terminal track configuration allowing for the achievement of service expansion as described on page 1-20. An interim measure already completed permits the reduction of the minimum scheduled headway to 3 minutes 30 seconds through train control modifications in the vicinity of Daly City Station. This will facilitate the addition of one peak hour train when completion of fire hardening makes available additional vehicles.

New Vehicle Automatic Train Control System (ATC)

Current on-board ATC equipment represents the largest cause of service disruptions. The New Vehicle ATC system will substantially reduce ATC hardware failures and, through the use of built-in automatic operational redundancy, reduce ATC-caused service-disrupting failures by a factor of 25 to 1. This system will be installed in all new C-cars, and will also be retrofitted into existing A-cars.

M-87 Interlocking

As presently configured, the M-87 interlocking includes a crossover in front of the Daly City Station main platform (tracks 1 and 2), and a turnout, nearer the station, to Track 3. This configuration results in interference between a train coming in to berth on Track 3 and another being dispatched from Track 1. By moving the turnout to Track 3 beyond the crossover, such interference will be eliminated. This change will further enhance train movement flexibility in the vicinity of the Daly City Turnback.

Wayside Train Control System Installations

The System Performance Study determined that a number of improvements will be necessary, in addition to those listed above, to achieve BART's capacity objectives while maintaining or enhancing service quality. This program includes the following key tasks:

- o Reconfiguration of track circuits by moving and adding blocks,
- o Resignalling of some parts of the system,
- o Modification of station approach markers,
- o Modification of SORS software to reduce time to initialize (reset) the system,
- o Enhancement of central computer control capabilities,
- o Development of a delay reduction program,
- o Enhancement of train operations simulation capability.

Brake Rate Algorithm Modifications

As noted above, attainment of the 2 minute 15 second headway objective will require certain brake rate algorithm modifications based on thorough analyses, and CPUC approval. Schedules for this work remain to be developed. Likewise a firm start date for this service level has not been determined.

Until capacity expansion projects are in place and service improvements started, the District will strive to improve performance within existing operational limitations.

Priority capital projects in support of basic system service and capacity are summarized in Figure II-12 beginning on page I-56.

PROGRAM AREA OBJECTIVES

Revised operating performance objectives for the current five-year period are identified in Figure II-1 on the following page.

PROGRAM AREA B: RELIABILITY

Improved service quality has largely been responsible for increased BART patronage. Continued growth of BART ridership will depend heavily on the extent to which service quality can be maintained and improved further, in light of adding more trains on the system to increase capacity.

The reliability improvement program and BART's well established preventative maintenance program have greatly assisted in improving service quality dramatically within the past decade. Whereas train on-time performance averaged well below 50% prior to FY 1978/79, today's level is above 90%, even with the delay impacts associated with construction for the Daly City Turnback and the KE Track. In the same time period, the percentage of scheduled train dispatches completed increased from 86% to 99%, while the rate for passenger offloads due to vehicle equipment was reduced by 21%.

FY 1985/86 OBJECTIVE STATUS

As noted under Basic System Service and Capacity, implementation phases of the KE Track and the Daly City Turnback, which began during the summer of 1985, had a direct impact on reliability performance. This impact is noted under appropriate indicators in the following discussion.

The percent of scheduled train dispatches completed averaged 98.5% for the July-December 1985 period. This level of performance is just under the 99% objective level.

Weekday train on-time performance averaged 91.1%, versus a 95% objective. Analysis of train performance data revealed that on-time performance would have been on the order of 94.4% had construction for the KE Track and Daly City Turnback not affected revenue service. For peak period operations, train on-time performance averaged 88.8%, compared to a 93% objective. It is estimated that KE and Daly City construction work reduced peak period on-time performance by 4 percentage points, from 92.8%.

This reduced level of schedule adherence resulted in lower than desired patron on-time performance which averaged 86.2% for the first half of FY 1985/86. Approximately 6.5 percentage points have been attributed to the impact of KE and Daly City construction. Without the impact, patron on-time performance is estimated to be on the order of 92.7%, versus a 94% objective.

The rate for primary delay events (causing peak period trains to be detained more than 7 minutes) averaged 3.10 events per 100 train runs during the first half of FY

Figure II-1

BASIC SYSTEM SERVICE AND CAPACITY PERFORMANCE OBJECTIVES

FY 1986/87

1. Balance capacity where possible such that load factors for peak period trains which can be lengthened or shortened (consists between 3 and 10 cars) are relatively equal and provide offpeak service such that no train load factor exceeds 1.05.
2. Operate weekday peak period Transbay service in the peak direction providing at least 98.0% of scheduled train throughput and 97.5% of scheduled car throughput on a monthly average basis.
3. Until December 31, 1986, make available 102 A-cars and 261 B-cars for revenue service by 4 a.m. (weekdays); thereafter, make available 106 A-cars and 270 B-cars.
4. Increase peak period capacity from 43 trains to 45 trains by adding one train each to the two most heavily travelled routes (Fremont/Daly City and Concord/Daly City) by January 1987.

FY 1987/88 to FY 1990/91

1. Operate 4-route weekday service with the capability of providing sustained 3 minute 10 second-headways by September 1988 following the completion of the Daly City Turnback reducing to 2 minutes 30 seconds by September 1989 following the completion of remaining capacity expansion projects.
2. Support the following weekday car requirements (as of the fourth quarter of each fiscal year):

<u>Service Requirements</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>
A-Cars	112	114	114	114
B-Cars	270	270	270	270
C-Cars	41	119	128	128
TOTAL	423	503	512	512

<u>Service Distribution</u>				
On-Line	383	446	450	450
Spares	40	57	62	62
TOTAL	423	503	512	512

<u>Total Fleet:</u>				
A-Cars	135	135	135	135
B-Cars	300	300	300	300
C-Cars	48	150	150	150
TOTAL	483	585	585	585

1985/86 (versus an objective rate of no more than 2 events per 100 trains). As a result of the peak period delay events, 9.47% of all peak period train runs were detained more than 7 minutes. This compares to the current objective which calls for a maximum train delay rate of 6%. The impact of each delay event thus detained an average of 3.1 trains more than 7 minutes.

The District's offload objective is measured in terms of a 12-month average rate. As of December 1985, total offload incidents amounted to 2,303. This resulted in a total offload rate of 2.03 incidents per 1,000 car hours (versus an objective rate of 1.35 incidents per 1,000 hours). The current annual rate is 28.5% higher than recorded one year earlier (as of December 1984), and is due primarily to a revision in the accounting method with respect to operations and miscellaneous caused offloads at South Hayward Station.

Of the 2,303 total offloads for the current 12-month period, 1,173 (50.9%) were the result of vehicle equipment, 122 (5.3%) were wayside equipment related, and 1,008 (43.8%) were due to operational and miscellaneous causes. The resulting 12-month incident rates per 1,000 car hours for these offload categories are: 1.03 for vehicle equipment (relative to a 1.10 objective rate), 0.11 for wayside equipment (versus a 0.05 objective rate), and 0.89 for operational and miscellaneous causes (versus a 0.20 objective rate).

Performance for automatic fare collection equipment, as measured by the maintenance technician rate, averaged 0.37 incidents per 1,000 passenger trips during the July-December 1985 period. Current performance compares to a District's AFC objective of 0.30 incidents per 1,000 trips.

Six AM availability for entry/exit gates averaged 91.7% (versus an objective of 95%). For ticket vendors, availability was 83.5% (versus a 90% objective).

The District's objective for station elevators is to maintain 6 AM availability no lower than 95%. During July-December 1985, elevator availability surpassed this objective, averaging 99.5%.

Performance for escalators also surpassed the District's 93% availability objective, with a current period average of 96.8% of all station units in service by 6 AM.

The terms of the purchase of service agreement between the District and AC Transit calls for the provision of 95% express bus on-time performance. Based on a 47% sample of all BART express bus runs during July-December 1985, 97.2% of the runs arrived at their final destination within 5 minutes of schedule.

FUTURE OUTLOOK

Based on year-to-date performance, objective achievement is anticipated with regard to scheduled weekday train dispatches completed, vehicle offload rate, elevator and escalator availability, and express bus on-time performance. Improved schedule adherence, which is expected for the latter half of FY 1985/86 in response to the completion of the KE Track and the current construction phase of the Daly City Turnback, should result in a return to typical (pre-construction) train-and patron on-time performance. Anticipated higher performance for the second half of the fiscal year, however, appears to be insufficient to raise respective indicator averages to objective levels for the year.

PLANNED IMPROVEMENTS

The major thrust in this area will be to continue to improve service quality further and at a minimum to maintain performance standards under higher density train operations. This will be done by the following:

- o Continued scrutiny of both rolling stock and wayside equipment as regards failure trends and reliability rates using the MARIS information system.
- o Further implementation of a time control system which will permit more maintenance to be scheduled and reduce unscheduled maintenance.
- o Installation of the second generation ATO on BART's current fleet of A-cars (C-cars will also contain this new equipment). The ATO system does not meet acceptable reliability and maintainability standards. The new ATO is expected to show an improvement of 25 to 1.

The District currently has 24 engineers dedicated to direct maintenance support. These consist of 12 engineers for revenue vehicle maintenance and 12 for wayside maintenance. Efforts are coordinated between these engineers and maintenance staff to solve problems, analyze failures, develop maintenance procedures, and implement modifications. The Engineering and Construction Department supports longer range maintenance activities by providing designs for projects as they are identified (i.e., C-cars, Daly City turnback/storage facility, etc.) and develops modifications of current equipment. Since 1976, BART has increased on-line trains by 30% and the number of car hours by 57%, but decreased total maintenance staff by 12%. Future increases in service, however, will require increases in maintenance personnel.

All maintenance staff participate in a comprehensive maintenance training program which includes certification following successful completion of required coursework. A technical training staff of 16 people provides this service, in addition to general training courses provided by the District to enhance management's effectiveness.

Important capital improvement efforts in this area include installing new ATO units on all A-cars. Other capital projects which address system reliability are identified in Figure II-2 beginning on page II-56.

PROGRAM AREA OBJECTIVES

Revised operating performance objectives for this program area are as identified in Figure II-2 on the following page.

Figure II-2

RELIABILITY PERFORMANCE OBJECTIVES

FY 1986/87

1. Complete 99% of all monthly scheduled dispatches.
2. Conduct operations such that on a monthly basis 95% of daily terminal-to-terminal runs are completed within 5 minutes of scheduled run times with at least 93% during AM and PM peak periods for commute days.
3. Provide service such that no more than 2% of peak period trains experience a primary delay exceeding 7 minutes and no more than 6% experience a delay from any cause exceeding 7 minutes.
4. Conduct operations such that on a quarterly basis, 94% of all patron trips are completed on-time. All patron trips are on-time when trains run not more than 5 minutes late or 60 seconds early.
5. Provide service such that passenger offload rates remain at or below the following: vehicle equipment = 1.10; wayside equipment = 0.10; operations and other = 0.80; and the total = 2.00.
6. Maintain the overall AFC technician maintenance incident rate at or below 0.30 incidents per 1,000 passenger trips, and maintain or exceed a 6 AM average weekday availability rate of 95% for entry/exit gates and 90% for ticket vendors.
7. Maintain a 6 AM average weekday availability of 95% for elevators and 93% for escalators.
8. Maintain express bus ontime performance such that 95% of all runs arrive at their final destination within 5 minutes of schedule.

FY 1987/88 to FY 1990/91

1. At a minimum, maintain current reliability objective level performance under higher density train operations pending additional improvements which may be identified by the System Performance Study.

PROGRAM AREA C: SAFETY AND SECURITY

Patron safety has always been of paramount concern to the District. As such, facilities and operations planning are performed in concert with BART's Safety Department to assure adherence to accepted industrywide safety standards. Numerous improvements have been made in BART's 13-year operating history in addition to the safety features included in the system's original design. These include modifications to vehicles, stations, right-of-way protection, and parking areas which have been implemented as a result of recommendations based on intensive and ongoing analyses of accident data. Further, the experience of the 1979 Transbay Tube fire and follow-up investigation provided BART and the entire transit industry with greater insight regarding emergency preparedness and life safety. The recommendations of this investigation were incorporated into an aggressive program to improve the safety of facilities and operations even further, which included the replacement of all vehicle seat cushions and covers with low-smoke/flame-resistant material.

Numerous other safety improvements were implemented in accordance with the investigation's recommendations. Equally as important has been the 198 publication of an extensive and detailed emergency plan for BART which was developed in cooperation with local emergency service agencies. This has led to improved communications coordination and a better understanding of the BART system on the part of local fire departments and other emergency service providers. BART facility tours and drills are conducted on an on-going basis to assure that emergency response capabilities are maximized for critical kinds of situations at all system locations.

The District's annual patron accident rate has declined because patronage has increased more rapidly than the number of patron accidents. The number of annual passengers between FY 1978/79 and FY 1983/84, for example, grew by 41.5%, whereas the number of patron accidents increased at a much lower 9.8%. The resulting annual accident rate per million passengers thus declined 22.3%, from 22.0 to 17.1 during this five-year period.

The establishment of BART Police Services prior to the start-up of revenue operations in September 1972 was an early recognition of the District's special security requirements. Patron security has subsequently been emphasized throughout BART's planning and operational history.

Compared to many older rail transit systems, serious crimes against patrons have remained at a relatively low level. Since the latter part of 1981, BART's 12-month average patron related crime rate excluding disorderly conduct has fluctuated between 9 and 11 incidents per million passenger trips. In contrast to this is the rate for disorderly conduct which has increased substantially during the same 4-year period. As of June 1981, the 12-month rate for disorderly conduct stood at 5.3 incidents per million passenger trips. By June 1983, this rate increased to 8.4, and 13.3 incidents per million passengers in June 1985. In part, this increase reflects passage of State legislation which empowered transit district police officers to issue citations for certain offenses included under disorderly conduct. The increase in the 12-month rate for disorderly conduct pushed the rate for all patron-related crimes up 26.5% in four years, from 18.5 incidents per million passenger trips in June 1981 to 23.3 in June 1985.

This program area also focuses on the safety and security of BART employees. Discussion of this consideration is included in the following sections.

FY 1985/86 OBJECTIVE STATUS

Performance relating to patron safety is favorable as indicated by the patron accident rate which was 2.3% lower than the stated objective. As of December 1985, the 12-month average accident rate was 17.3 incidents per million trips (versus an objective of 17.7). Actual incidents increased 11.3%, from 952 accidents during calendar year 1984 to 1,060 in 1985. For the current number of annual incidents, 805 (75.9%) occurred within stations with the remaining 255 (24.1%) accidents related to train operations. Since revenue service began in September 1972, BART has carried 532.0 million patrons 7.0 billion passenger miles without a single patron fatality.

Total incidents of patron-related crime increased 4.3%, from 1,398 during 1984 to 1,458 in 1985. Increases are recorded for rape (up from 4 last year to 5 this year), robbery (up from 97 to 134), assault/battery (up from 319 to 359), arson (up from 8 to 18), and purse snatching (up from 62 to 85). Decreases this year relative to 1984 are recorded for murder (down from 2 to 1), sex offenses other than rape (down from 90 to 82), and disorderly conduct (down from 856 to 815).

BART's patron-related crime objective for FY 1985/86 calls for a 12-month rate no higher than 18.5 total incidents per million passenger trips. For FY 1985/86, the FY 1984/85 objective was retained although actual experience exceeded this level at the time the objective was set. This objective was not revised upwards because it was felt one additional year of observation was needed to establish a realistic performance standard consistent with patron needs and the District's financial capabilities.

The District's patron-related crime rate for the 12-month period ending December 1985 is 23.7 incidents per million trips, 1.3% above the 23.4 annual rate reported for 1984. The current annual rate is based on 1,458 patron-related crimes, 815 (55.9%) of which are for disorderly conduct and 643 (44.1%) for all other categories listed above. The resulting annual rate per million passenger trips for disorderly conduct is 13.3, versus an objective of 9.5. For all other categories of patron-related crime, the annual rate is 10.5 incidents per million trips, compared to an objective rate of 9.0.

Employee lost time injuries during July-December 1985 resulted in a loss of 0.56% of all hours worked. This compares to a lost-time objective of no more than 0.50%.

One of BART's safety objectives for FY 1985/86 is to conduct an average of one emergency procedures/safety session each month with representatives of local fire departments and other emergency service providers. During the first half of the current fiscal year, BART conducted 5 of these sessions which involved 143 fire department representatives. These sessions include: 1 system familiarization tour, 3 smoke movement drills, and 1 emergency procedures training exercise on aerial structure.

Other activities in the area of patron safety include the continued testing of materials for the Platform Edge Detection Project which is designed to improve safety for vision impaired patrons. The platform edges at Berkeley, Montgomery, and Rockridge stations have been grooved and re-filled with a slightly raised material for easier edge recognition. Additionally, a rubber-tile surface was installed at the Lake Merritt Station platform edges. This project and the Elevator Modification project have been identified as part of improving access to BART by elderly and handicapped persons. Modifications to elevators at Berkeley and El Cerrito del Norte Stations being implemented this fiscal year include: lowering control panels and telephones to accommodate patrons in wheelchairs, and installing communication and a card-reader devices. Additional details for these projects are provided under System Access on page II-45.

FUTURE OUTLOOK

Patron accidents have held fairly steady over the past five years, with 12-month totals fluctuating between 850 and 1,100 incidents. Corresponding accident rates range from a low of 15.8 accidents per million trips to a high of 19.1 (versus an annual rate of 17.3 accidents per million trips as of December 1985). Given this relatively flat profile, BART's 12-month patron accident rate is expected to remain favorable relative to the current year's objective of 17.7 accidents per million passenger trips. This, however, assumes that the number of accidents will decrease in proportion to the decrease in ridership which is expected as a result of the January 1, 1986 fare increase.

BART's patron-related crime rate is currently substantially higher than the desired objective. The upward trend for the 12-month average rate which began in early 1982 appears to have leveled off beginning in mid-1984. The 12-month patron-related crime rate since June 1984 has fluctuated between 23.0 and 24.1 incidents per million trips. This trend generally corresponds to the leveling of disorderly conduct incidents which also started in mid-1984. Whereas, incidents of disorderly conduct constituted a growing percentage of all patron-related crimes for the past 2 1/2 years through mid-1984, this trend appears to have reversed as evidenced by 1985 data. The percentage of disorderly conduct incidents to all patron-related crimes in 1982, 1983, and 1984 was: 41.2%, 52.6%, and 61.2%, respectively. This compares to 55.9% for 1985. Despite this leveling, the rates for incidents of disorderly conduct, all other patron-related crimes, and total incidents, remain well above the District's objectives, as noted in the "Objective Status" section. In recognition of actual experience to date, and given the current level of police staffing, it is proposed that the objective rates be revised for FY 1986/87 to 13.5 per million for disorderly conduct and 10.7 per million for all others. Large increases in the budget allocation for additional police staffing with which to attain the prior objective does not seem warranted in view of current and future financial constraints and the needs of the patron.

The District's employee lost-time rate is currently 12% above the desired objective level of 0.50% of all hours worked. This objective could be achieved by year's end given diligent efforts in the second half of FY 1985/86. Future efforts will need to continue to enhance the District's job training program to maintain favorable performance in this area.

The District's emergency preparedness/safety session objective could be achieved this year if seven sessions are conducted in the remaining six months (one more than called for under the current objective). BART's Safety Department is involved in an intensive on-going program with local emergency service providers for the purpose of maximizing response capabilities to events on the system.

Completion of important emergency preparedness and life safety improvements which will permit BART to operate safely under higher density train operations is essential. Providing a new Daly City Turnback, ICS, C-cars, and other capacity projects alone will not permit the operation of closer headway service. A critical element is the removal of the currently imposed CPUC subway vent separation requirement. This can only come about through the completion of the District's vehicle fire-hardening program (programmed for completion in September 1986) followed by timely CPUC authorization to eliminate the vent separation requirement.

PLANNED IMPROVEMENTS

Efforts in the area of safety and security will continue to concentrate on minimizing incidents of patron-related crime and accidents for both patrons and employees.

The effective deployment of BART police will be the prime strategy for combating crime on trains, in station areas, and along track rights-of-way. Computer programs

for tracking and dispatching police officers will continue to be used, as well as other information systems for the accurate and timely reporting of crime data.

In the area of patron safety and property protection, efforts will continue to focus on the District's comprehensive emergency preparedness and life safety program in order to minimize the risks to BART riders. Expansion of system capacity will require the removal of the CPUC imposed subway vent separation requirement so that trains may operate closer together throughout the system. The completion of the vehicle fire hardening program, currently estimated for September 1986, is an important project for improving fire safety and a prerequisite for eliminating this capacity restraint. Under this project, all vehicle floors will be improved and ceiling liners will be replaced to reduce flammability and toxic smoke emissions.

In addition to vehicle safety improvements are those for wayside facilities required for improving passenger safety and property protection. To date, wayside safety projects in excess of \$3 million have been identified based on recommendations contained in the Gage Babcock Wayside Safety Study (completed in June 1982) and those of the District Wayside Task Force, which is composed of BART safety staff, representatives of Gage Babcock consultants, local fire departments, and others. These projects fall into four categories of improvements: critical life safety, important life safety, primary property protection, and less important property protection.

An additional project is the Regional Rail Transit Emergency Training Program which will involve approximately 4,500 participants from BART and local fire departments. This program will provide classroom instruction, simulated emergency drills, and other techniques for the purpose of improving emergency preparedness and response times.

The completion of these safety improvements by 1987 and others soon to be identified will provide increased levels of safety and emergency preparedness. This will permit BART to operate closer headway service while maintaining stringent safety standards. Capital projects addressing improved BART safety and security are identified in Figure II-12 beginning on page II-56.

PROGRAM AREA OBJECTIVES

Updated operating performance for safety and security are identified in Figure II-3 below.

Figure II-3

SAFETY AND SECURITY PERFORMANCE OBJECTIVES

FY 1986/87

1. Provide sufficient police coverage such that the rate of patron-related crimes does not exceed 13.5 per million passengers for disorderly conduct and 10.7 per million for all others.
2. Continue to provide an environment for patron circulation through trains and stations such that the accident rate does not exceed 17.7 per million passengers.
3. Reduce the total annual amount of employee lost time due to injuries as a percent of time worked to 0.50% or less.
4. Conduct a minimum of one emergency plan exercise per month involving emergency response agencies.

FY 1987/88 to 1990/91

1. Maintain a rate of patron-related crime below those for District communities and other transit systems in the Bay Area and in other metropolitan areas.

PROGRAM AREA D: PATRONAGE AND TRAVEL PROMOTION

Use of the BART system increased steadily over the years, until mid-1985. As indicated in Table I-1, growth rates generally exceeded 5% until that time. Since then, growth during the two quarters prior to the January 1, 1986 fare increase averaged less than 2% annually. (A comprehensive discussion of potential demand appears in Chapter I.)

A number of factors may have influenced this change in growth rates. Since mid-1985, construction of two capacity expansion projects, the Daly City Turnback and the KE Track, appears to have impacted BART service quality adversely. In addition, gasoline prices were falling concurrently. Finally, BART peak period capacity has been limited for over two years by a lack of any additional revenue vehicles. These three factors probably caused the observed flattening out of patronage growth

Ridership surveys indicate that BART patrons are representative of the area wide population generally, and are not confined to any one socio-economic bracket. Commuting to work and work related travel comprise over 70% of BART trips. But use of BART for non-work purposes, especially shopping and access to entertainment facilities is on the upswing.

Future growth potential is expected to be good once BART capacity is increased. Expansion of office development in the central business districts of San Francisco and Oakland continues to support a growing employment, and commuting, market in these areas. In addition, significant transportation capacity improvements in corridors served by BART are not expected during the planning period. Traffic congestion on

the San Francisco-Oakland Bay Bridge is significant, and parking in the City is either expensive or hard to find. Finally, BART plans to improve its access capacity as well as its train capacity. These three factors should sustain BART growth into the future.

For planning purposes during implementation of the Capacity Expansion Program, lower growth rates have been assumed in this update relative to the previous plan. This seems warranted in view of the recent decline in growth rates, uncertainty regarding gasoline prices, and the limits on BART's ability to transport more riders until the the Capacity Expansion Program is completed.

FY 1985/86 OBJECTIVE STATUS

With the majority of peak period trains operating above a 1.30 load factor in the peak direction, offpeak and reverse commute travel continue to be the primary targets for BART promotional efforts. Activities during the July-December 1985 period were coordinated with major Bay Area events including those held at the Oakland Coliseum (A's and Warrior's games, Ice Capades, Bruce Springsteen concert, etc.), the Bridge-to-Bridge foot race and Mexican Independence Day parade in San Francisco, and numerous other events in the East and Westbay.

The Thanksgiving-Christmas holiday season served as a focal point for intensifying the District's "BART Goes Shopping, Too!" campaign. In support of this offpeak marketing effort, BART provided direct Transbay service on the Richmond and Fremont lines on each Sunday between Thanksgiving and Christmas (the third consecutive year for this service). Four "Shopper's Specials" departed both Richmond and Fremont terminal stations at 40-minute intervals between 10 AM and noon destined for San Francisco/Daly City. Direct Transbay service back along the Richmond and Fremont lines was timed to retail store closings with these eight special trains (four on each route) departing Daly City between 4:30 and 5:30 PM. Operation of the "Shopper's Specials" was in addition to regularly scheduled 20-minute interval Sunday service on the Concord/Daly City and Richmond/Fremont routes. The eight "Shopper's Special" trains averaged approximately 2,600 trips on each of the four Sundays they were in operation. This is the same level of use for this special service as recorded last year.

In an effort to increase travel convenience and promote additional ridership, the BART Board of Directors approved in August 1985 a six-month test calling for an extension of weekday Transbay service on the Richmond/Daly City and Fremont/Daly City routes. The extended Transbay service began on September 9 with a weekday schedule calling for the last San Francisco-bound (no-transfer) trains on these two routes to depart their Richmond and Fremont terminal stations at approximately 7 PM (versus 6 PM as specified in the published schedule). These same last trains are scheduled to depart downtown San Francisco stations at approximately 8:30 PM (versus 7:30 PM previously), providing Transbay service back along their respective routes. After this time, systemwide service is provided on the Concord/Daly City and Richmond/Fremont routes. Ridership response to this service increment did not reach the breakeven level target during the test and therefore the extra service was cancelled effective March 7, 1986.

Additional promotional activities during the July-December 1985 period include the availability of the second edition of the Bay Area Transit Directory (published by a private firm and provided free at all BART stations), the availability of an updated "Fun Goes Farther on BART" brochure, and expansion of Bay Area teleguides to include all downtown San Francisco stations.

Total ridership of 30,812,393 for the first six months of FY 1985/86 is 2.6% below a forecast of 31,631,900, and 2.0% above the 30,197,406 trips for the same period a year earlier. This year's figure includes a 3,343,203 BART/MUNI Fast Pass trips, a 25.4% increase for Fast Pass BART travel relative to July-December 1984. This

Table II-2
BART/MUNI FAST PASS USE
QUARTERLY AVERAGES SINCE START-UP

<u>Quarter</u>	<u>Total Trips</u>	<u>Average Weekday</u>	<u>Average Saturday</u>	<u>Average Sunday</u>
Apr-Jun 1983	942,929	13,325	4,491	2,265
Jul-Sep 1983	1,078,848	15,215	5,215	2,387
Oct-Dec 1983	1,221,632	17,509	5,964	2,904
Jan-Mar 1984	1,279,123	18,180	6,540	2,984
Apr-Jun 1984	1,263,240	17,760	6,295	3,022
Jul-Sep 1984	1,225,981	17,340	5,649	2,953
Oct-Dec 1984	1,440,707	20,605	7,479	3,606
Jan-Mar 1985	1,587,704	22,935	8,194	3,896
Apr-Jun 1985	1,729,086	24,327	8,677	4,053
Jul-Sep 1985	1,676,683	23,655	8,358	3,763
Oct-Dec 1985	1,666,520	23,956	8,283	3,223

substantial increase is due, in part, to the monthly Fast Pass price reduction from \$24 to \$20 which took effect in October 1984. Currently, 10.9% of all BART trips are made with a Fast Pass.

Average weekday ridership increased 1.0% from an average of 210,494 for July-December 1984 to 212,511 for the same period in 1985. The current average is 3.8% below a forecast of 220,922 average weekday trips. For similar reasons as cited above, year-to-date average weekday Fast Pass usage increased 25.7% from 18,932 during July-December 1984 to 23,803 currently. An estimated 25% of the 100,000 people who attended two Bruce Springsteen concerts at the Oakland Coliseum took BART to the event. This resulted in approximately 25,000 additional trips on each of the two concert days. A new average weekday ridership record was established on Wednesday, September 18, 1985, the day of the first concert, with 238,866 trips. This was topped on Thursday, September 19, 1985, the day of the second concert, with 240,292 trips. This and other BART ridership records are summarized in Table II-3 on page II-2/A.

Year-to-date ridership for the four peak hours increased 0.5% from 103,884 last year to 104,455. The current average is 7.3% below a forecast of 112,626 peak period trips. Weekday offpeak patronage increased 1.2%, from 106,611 for the first 6 months last fiscal year to 108,056. The current average is 0.3% below a year-to-date forecast of 108,401 weekday offpeak trips, relative to the District's 3% marketing objective for additional (above forecast) offpeak system usage.

Year-to-date Saturday ridership averaged 90,274 trips, 5.8% above last year's average for the same period of 85,322. The current average is 6.0% above a year-to-date Saturday forecast of 85,181, twice the 3% above forecast marketing objective.

Holiday shopping, which traditionally intensifies the last two or three weeks before Christmas, helped push Saturday ridership 17.2% above forecast for December. Additionally, a new Saturday ridership record was set on November 9, 1985, the day of the U.C. Berkeley/U.S.C. football game in Berkeley. Saturday BART/MUNI Fast Pass usage increased 22.7% from an average of 6,781 during July-December 1984 to 8,320 currently (or 9.2% of systemwide Saturday ridership).

Year-to-date Sunday ridership decreased 0.2% relative to July-December 1984. The current average is 50,317 Sunday trips, down slightly from a year-to-date average last year of 50,414. The current average is 1.3% above a forecast of 49,654, relative to the District's 3% marketing objective for Sunday system usage. For the Sundays between Thanksgiving and Christmas, when the "Shopper's Special" trains were provided, Sunday ridership averaged 52,833 trips. This is slightly higher than the 52,693 average recorded for the Sunday's during the 1984 holiday season. Average Sunday BART/MUNI Fast Pass trips increased 6.9% from 3,267 during July-December 1984 to 3,493 for the current 6-month period (or 6.9% of average Sunday ridership).

Monthly surveys for the first 6 months of this fiscal year indicates 93.2% of all station area facilities are at or above the standards established for cleanliness. This surpasses the 90% cleanliness objective and is just under 93.3% which was reported for July-December 1984.

Similar surveys for car cleanliness indicates that 82.1% of all evaluations for carpets, seats, windows, walls and ceilings were either at or above desired standards, for the July-December 1985 period. This compares to an objective of 90%. Although not specifically called out in this year's objectives set, the Car Cleaning and Exterior Restoration Project (which began in April 1985) was completed in March 1986. Under this project, all 440 BART cars were restored to their original silver-aluminum appearance, all logos and car numbers replaced, and, where possible, car-body dents removed.

Patron complaints regarding public contact employees totalled 253 during July-December 1985, 2.3% below the 259 complaints received during the same 6 month

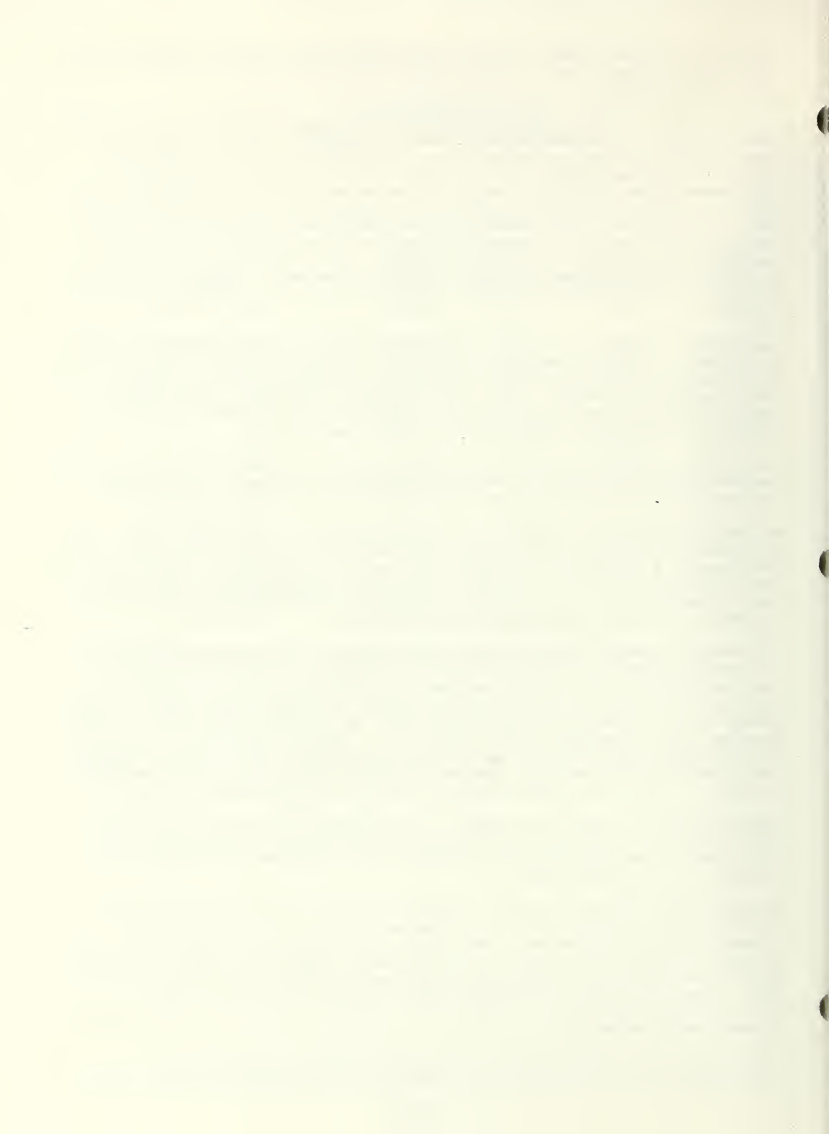


Table II-3
BART PATRONAGE RECORDS
 As of December 31, 1985

<u>HIGHEST DAYS</u>	
Monday, July 16, 1984	235,244
Tuesday, July 17, 1984	229,055
Wednesday, September 18, 1985	238,866
*Thursday, September 19, 1985	240,242
Friday, April 12, 1985	231,745
Saturday, November 9, 1985	108,303
Sunday, July 15, 1984	77,434
<u>HIGHEST MONTHLY WEEKDAY AVERAGE</u>	
April 1985	216,155
<u>HIGHEST WEEKLY AVERAGE (Weekdays Only)</u>	
July 16-20, 1984	226,989
<u>HIGHEST MONTHLY TOTAL TRIPS</u>	
*October 1985	5,404,565
<u>HIGHEST 12-MONTH TOTAL TRIPS</u>	
*January 1985 through December 1985	61,413,406

* All-time record day.

period last year. The year-to-date patron complaint rate regarding public contact employees declined from 8.58 complaints per million passenger trips last year to 8.21 currently. This compares favorably to a District objective rate of no higher than 8.75 complaints per million trips.

The District's objective for on-board service announcements is to achieve a 95% rating based on the Passenger Services Sampling Survey. Ratings are derived by weighting the percentages which reflect the on-board service announcements actually made versus those required (announcements are for arrival stations, transfer points, delays of 1-5 minutes, and delays more than 5 minutes). Because this survey is conducted on an annual basis each May, current year-to-date data are not available. The rating based on the May 1985 Passenger Services Sampling Survey was 91.1%, up from 89.2% in May 1984.

FUTURE OUTLOOK

Lack of growth of peak period ridership, which is attributed to on-line capacity constraints, limited station parking, a lowering of gasoline prices, and other factors discussed in Chapter I is expected to result in year-end performance below budget relative to the peak four-hour ridership objective for FY 1985/86. Year-to-date peak four-hour train ridership is running 7.3% under budget. Actual ridership versus forecasts for the latter half of the fiscal year (which was based on relatively conservative assumptions reflecting the impact of the January 1, 1986 fare increase), may bring the annual average closer in line with budget.

As a result of below budget peak ridership, which traditionally constitutes approximately one-half of all weekday trips, BART's average weekday ridership is also below budget (by 3.8%). Offpeak weekday ridership is almost on target, just 0.3% below the desired level. Achievement of BART's average weekday ridership objective for FY 1985/86 thus appears to be more dependent upon peak ridership response following the January 1986 fare increase relative to budget.

While the fare increase is expected to have a greater impact on discretionary travel (i.e.: most of BART's offpeak trips), strong year-to-date performance for Saturday ridership (at 6.0% above forecast) should lead to achievement of BART's Saturday patronage objective, and quite possibly the 3% above forecast marketing objective.

Achievement of BART's Sunday ridership objective is also likely by year's end. However, since the current Sunday average is only 1.3% above forecast, the probability of attaining the 3% above forecast marketing objective for Sunday appears considerably less likely relative to Saturday. Strong patronage response to major events served by the system which are held on Sundays, such as the A's games and Bay-to-Breakers during the fourth quarter, could assist in increasing Sunday ridership further above forecast.

It is anticipated that Patronage and Travel Promotion objectives for station cleanliness and patron complaints regarding public contact employees will be achieved this year. Improved performance with respect to car cleanliness will be required during the second half of the year in order to achieve this objective, however.

Based on the last two annual Passenger's Services Sampling Surveys (which indicated below objective performance), improved performance will be required with regard to on-board service announcements in order to achieve a 95% rating for the May 1986 survey.

PLANNED IMPROVEMENTS

The realization of BART demand forecasts is greatly dependent upon the District's ability to provide an acceptable quantity and quality of service at a given fare level. Within its 13-year operating history, the District has made very substantial improvements in both service capacity and quality while minimizing the impacts of required fare increases. And, as patronage records reveal, public response has been very favorable with sharp increases in ridership occurring with each major service improvement.

As highway congestion continues to increase and automobile operating costs rise, demand for BART service will expand. To maintain high quality service under these conditions will require the timely implementation of essential capital improvements identified in this plan.

Until substantial increases can be provided for peak period capacity in the primary demand direction, promotional efforts will continue to focus on attracting additional offpeak and reverse commute ridership. Strategies will build upon the information base established by the Passenger Profile and Latent Demand Surveys. Efforts in the area of patronage and travel promotion will subsequently focus on realizing demand forecasts through programmed service improvements and effective marketing strategies focusing on specific market segments, such as BART travel for shopping purposes. This includes the introduction of additional inter-operator passes, improved system signage and transit information, and innovative ways to improve transfers between BART and other transit systems. Additionally, train and station area cleanliness, public contact employee helpfulness and courtesy, and service announcement accuracy will be continually monitored to assure acceptable performance is also being achieved.

Capital projects which are in support of achieving increased ridership, and realizing a greater portion of BART's potential, are identified in Figure II-12 beginning on page II-56.

PROGRAM AREA OBJECTIVES

Revised operating performance objectives for this program area identified in Figure II-4 on the following page.

PROGRAM AREA E: FINANCIAL AND OPERATIONAL EFFICIENCY

As discussed in Chapter I (see page 1-34), cost effectiveness and productivity are integral to overall financial performance and the economics of provided expanded levels of service. Continuous monitoring of expenses for all phases of operations and capital project development, in conjunction with stringent budgetary controls, have enhanced District financial performance. Additionally, improved management information systems have permitted the District to respond more quickly to changing operational requirements.

These efforts to improve BART productivity have, in real terms, resulted in declining costs per passenger, per passenger mile, and per vehicle mile over the past six and one-half years. This is shown by the constant dollar comparisons on pages I-37 and I-38. At the same time, BART patronage and vehicle miles per equivalent employee

Figure II-4

PATRONAGE AND TRAVEL PROMOTION PERFORMANCE OBJECTIVES

FY 1986/87

1. At a minimum, achieve normal growth projections for average daily patronage as follows (in 1,000's) at current fares:

Jul-Sep Oct-Dec Jan-Mar Apr-Jun FY 86/87

Average Weekday:

4-hour Peak: (TO BE UPDATED PER FY 1986/87 BUDGET)

Offpeak:

Saturday:

Sunday:

2. In addition to the above, actively promote offpeak ridership to achieve a 3% increase in travel as follows (1,000's).

Jul-Sep Oct-Dec Jan-Mar Apr-Jun FY 86/87

Weekday:

Saturday: (TO BE UPDATED PER FY 1986/87 BUDGET)

Sunday:

3. Continue sampling procedure to evaluate train and station area cleanliness, and maintain train and station cleanliness at or above an evaluation rating of 90%.
4. Continue concern for customer relations among public contact personnel such that the rate of patron complaints about this issue remains below 8.75 per million trips.
5. Continue public announcement procedures and practices such that the rating for four categories of announcements in the Passenger Services Sampling Survey averages at least 95%.
6. Complete installation of prototype passenger information panels at 12th Street/City Center Station.
7. Begin Regional Transit Association (RTA) passenger information panels project at BART stations.
8. In addition to existing bank ticket outlets, increase tickets-to-go outlets to 125 by June 1987.

FY 1987/88 to FY 1990/91

1. Maintain acceptable quality of service as reflected by accuracy of service announcements, employee helpfulness, and station cleanliness in support of achieving the following patronage levels at current fares (in 000's):

FY 87/88 FY 88/89 FY 89/90 FY 90/91

Average Weekday:

4-hour Peak:

Offpeak: (TO BE UPDATED PER FY 1986/87 BUDGET)

Saturday:

Sunday:

2. In addition to FY 1986/87 ticket outlets, tickets-to-go outlets by 25 each fiscal year.

have risen. This is solid evidence of BART productivity. Additional gains in the future may be harder to attain, thus management efforts should be focused on strategies to hold the line on expense, and to evaluate new ways of allocating resources in light of potential revenue returns. BART's Productivity Improvement Program (PIP) reflects this concern. The status for BART's 1985 PIP is summarized in Figure II-5. A more complete discussion is presented in Appendix B.

The availability of key financial and operational performance data is an essential element required for effective management and decision making in order to realize greater levels of efficiency. Timely and accurate information reporting has thus played a vital role in evaluating BART performance and identifying specific areas requiring improvement. In addition to the annual Five-Year Plan, seven regularly published reports serve as important sources of financial and operational information. These are as follows:

Monthly Patronage: Presentation of BART ridership data for calendar and budget periods, relative to forecast. Other data include passenger miles, average fares, and average trip distance.

Budget Performance Report: Documentation of monthly and year-to-date expenses, revenues, and financial assistance for operations relative to adopted budget. Also attached are brief explanations of significant revenue/expense variations to budget.

Quarterly Financial Statement: Documentation of District assets, liabilities, capitalization, financial operating results, and debt service funds.

Quarterly Performance Report on System Objectives: Status of District operating performance objectives, priority capital projects, and program area highlights.

Quarterly Operations Performance Report: Detailed documentation of operations performance with emphasis on reliability.

Quarterly Affirmative Action Report: Documentation of progress toward achieving the District's workforce representation and Minority Business Participation objectives.

Annual Report: Highlights of each fiscal year, including those for operations, capital improvements, and year-end financial statements.

In support of making these documents available in a timely manner, BART is continuing to upgrade its management information systems in order to provide improved data storage, manipulation, and reporting capabilities. The improvements made to date address a wide range of District concerns including financial, train operations, inventory control, labor and crime reporting.

FY 1985/86 OBJECTIVE STATUS

Six financial and operational efficiency objectives were adopted by the District Board of Directors for FY 1985/86. In addition to these are other objectives which have been identified as part of the District's FY 1985/86 Productivity Improvement Program. Status for the PIP objectives is summarized in Figure II- on page II- .

Favorable labor and non-labor expenses are recorded for the first half of FY 1985/86, at 1.6% and 8.7% below budget, respectively. Total operating expense for the July-December 1985 period remains 4.1% under budget. Below forecast ridership, however, has resulted in total net passenger revenue 3.2% unfavorable to budget.

Net passenger revenue covered 42.7% of total operating expense for the first half of the current fiscal year, compared to an annual objective of 48.0%. This objective reflects a higher level of fare generation, in accordance with the 30% average fare increase starting January 1, 1986, relative to the level of passenger revenue capable

FIGURE II-5
STATUS FOR BART'S 1985 PRODUCTIVITY IMPROVEMENT PROGRAM OBJECTIVES
 (As of December 1985)

PIP ELEMENT	FY 1985/86 OBJECTIVE*	JUL-DEC 85 STATUS		COMMENTS
Comprehensive Marketing Program (Short-Term)	Average Weekday Offpeak Trips (109,600)	108,056		** 104,100
	Average Saturday Trips (89,800)	90,274		** 84,200
	Average Sunday Trips (51,600)	50,317		** 48,400
	Rail operating cost per passenger mile (18.5¢)	18.5¢		** 18.8¢
	Rail farebox ratio (43.0%)	42.7%		** 51.4%
	Rail passenger revenue per seat-mile (3.3¢)	3.0¢		** 3.5¢
	Offsite ticket sales outlets -- number by year end (168)	139		(No Revision)
Capacity Expansion Program (Long-Term)	Targeted Project Completion Dates and Milestones for the Following Projects	Currently Scheduled Completion		
		Total Project	Milestone	
	KE Track (November 1985), project complete by November 1985	Mar 86	Mar 86	
	New ATC Prototype (October 1985) Production release by October 1985	Mar 86	Mar 86	
	Vehicle Fire Hardening (September 1986), Complete 420 Cars by June 1986	Oct 86	407 Cars by Jun 86	Contractor delay.
	Integrated Control System, Phases I & II (Phase I = January 1987, Phase II = December 1987), complete software production by April 1986	Oct 87	Feb 87	Project consolidated in Sep 8
	Second Generation Transit Vehicles (schedule under review), prototype delivery by August 1985	May 87	Oct 85	Four cars delivered in Oct 85
	Daly City Turnback (December 1987), complete civil construction by April 1986	Dec 87	Apr 86	
	Daly City Yard (March 1988), complete design by November 1985	Mar 88	Nov 85	

* Objectives are consistent with those reported to the RTPC in September 1985 based on the District's Draft FY 1985/86 Budget.

** Revised objectives are based on final adopted budget which includes the impact of the January 1986 30% fare increase.

of being generated under the fare structure in effect prior to that date. For the same reason, BART's rail farebox ratio was 45.9% during July-December 1985, compared to a 51.4% objective. Express bus farebox ratio averaged 13.1% versus a 17.1% objective.

Despite below forecast ridership, favorable operating expense resulted in a rail cost per passenger mile of 18.4¢ compared to an objective of 18.8¢ for the entire year.

The number of vehicle miles produced per equivalent District employee is within 4.2% of the desired level for the first half of the year, 15,708 actual versus 15,054 objective.

Year-to-date system utilization (passenger miles per seat mile, or average seat occupancy rating) is 35.9%, just under an objective of 36.5%.

Employee paid sick leave is also slightly unfavorable with year-to-date rate of 3.55% (sick hours paid to straight time hours paid) versus an objective of 3.5%.

Data continues to be collected and evaluated as part of the District's ongoing performance monitoring and assessment efforts. Key documents have been prepared and transmitted to the District Board of Directors, Department Managers, and other appropriate staff and outside agencies. The number of actual versus objective production days for each document thus far this year are as follows: Monthly Patronage Reports (10.3/10), Monthly Budget Performance Reports (14.0/15), Quarterly Affirmative Action Report (20.0/15), Quarterly Financial Statement (35.5/25), Quarterly Performance Report on System Objectives (36.5/35), and Quarterly Operations Performance Report (45.0/45).

FUTURE OUTLOOK

A key factor which will impact performance with respect to the District's farebox ratio objectives (for rail, express bus and total operation) is ridership response to the January 1, 1986 fare increase. Based on year-to-date performance, the level of erosion would have to be less than forecast (i.e.: ridership would have to be above forecast) in order to offset below budget ridership and passenger revenue during the first half of FY 1985/86.

On the expense side, rail cost per passenger mile is at a favorable level, and all indications are that this objective should be achieved for the year.

Performance with respect to vehicle miles per equivalent employee, system utilization, and employee paid sick leave also is favorable, all within 3 to 4 percentage points of desired levels. Assuming slight improvement for these productivity indicators during January-June 1986, all these objectives should be achieved by year's end.

Performance with respect to key report availability varies widely. The Monthly Patronage Report, Budget Performance Report, Quarterly Performance Report on System Objectives, and Quarterly Operations Performance Report have been made available either as planned or within 5 percentage points of the desired availability objectives. As a result, the objectives for these reports will in, all likelihood, be achieved for the year. Availability objectives for the Affirmative Action Report, Quarterly Financial Statements, and the Annual Report do not appear to be achievable this year.

Improved financial performance during the current SRTP timeframe is to be realized through stringent budget controls in concert with implementation of strategies to increase productivity. In support of this effort will be the timely availability of key financial and operations reports which permit BART management and the Board of Directors to be responsive to District needs and opportunities. Simultaneous

improvements already noted in such areas as reliability, service delivery (throughput), and financial effectiveness attest to the gains BART has made in its 13 year operating history.

PROGRAM AREA OBJECTIVES

Updated operating performance objectives for this program area are identified in Figure II-6 below.

Figure II-6

FINANCIAL AND OPERATIONAL EFFICIENCY PERFORMANCE OBJECTIVES*

FY 1986/87

1. Maintain a funded budget and farebox ratio of no less than ____% for BART express bus operations and ____% for rail operations.
2. Maintain a rail cost per passenger mile of ____¢ or less.
3. Achieve a level of service output such that ____ vehicle miles are produced per equivalent District employee (based on 2,000 hours worked, including overtime and excluding capitalized labor).
4. Improve system utilization (passenger miles per seat mile) to ____% through continued monitoring of train capacity to match passenger demand patterns.
5. Maintain a paid sick leave rate of no more than 3.5% (9.1 paid days) annually per employee.
6. Transmit key performance reports to the Board of Directors, Department Managers, and/or other recipients within the following number of working days after the close of each reporting period: Monthly Patronage Report (10), Monthly Budget Performance Report and Quarterly Affirmative Action Report (15), Quarterly Financial Statements (25), Quarterly Performance Report on System Objectives (35), Quarterly Operations Performance Report (45), and the Annual Report (75).

FY 1987/88 to FY 1990/91

1. Continue to provide cost-effective and efficient service through the achievement of key financial and operational efficiency objectives.

* Blanks to be filled in per adopted budget.

PROGRAM AREA F: AFFIRMATIVE ACTION

The purpose of the District's Affirmative Action Program is to formalize efforts to provide equal employment opportunity to all qualified persons, including minority/ethnic groups and women, and to assure that business enterprises owned by minorities and women are afforded the maximum practical opportunities to participate in the performance of all District contracts. The intent of the program is also to improve methods of resolving equal employment opportunity problems in accordance with federal and state legislation. The overall goals of BART's affirmative action program are:

- o To use Affirmative Action to achieve a District workforce at all job levels in which minorities and women are represented in proportion to their representation in the population of the BART District.
- o To increase opportunities for participation of disadvantaged and women-owned business enterprise in District contracting.

BART's Affirmative Action Plan (adopted by the District Board of Directors in June 1983) includes programs to achieve 3-year workforce representation objectives for women and minorities. The objectives were developed based on population characteristics for the three-county District per the 1980 U.S. Census and address representation within 15 job groups. Important elements of the plan are a job training program to promote the upward mobility of women, including placement within nontraditional jobs and for minorities in all job classifications and a classification maintenance program study that will determine the general availability of upward mobility opportunities within the District. Also included in the plan are a targeting process and an intensified community outreach program for the purpose of improving the availability of information regarding employment opportunities at BART.

BART's Minority Business Enterprise Program (adopted by the District Board of Directors in February 1984) includes procedures to attain practical participation goals for disadvantaged- and women-owned businesses in all District contracts, and for joint development opportunities.

Title VI

In compliance with Title VI (Civil Rights Act of 1964), BART submits to UMTA an assessment of rolling stock characteristics and distribution, a service area demographic profile, and service accessibility to specific minority and nonminority communities. A full assessment is submitted every 10 years based on most recent Census data. Interim updates are prepared annually reflecting service and/or fare revisions.

The District's 1983 submittal was based on 1980 census data which was used to prepare a profile of the service area including: population, median family income, civilian labor force, population trends, and automobile ownership. Profiles were prepared for both minority and nonminority populations as well as the total service area population.

A sample of 1,636 trip destinations were utilized in an analysis of travel time and costs for minority and nonminority analysis zones (based on Census tracts). Seven trip categories are included in the analysis. These are: employment, shopping, hospitals, social services, judicial courts, education, and central business district (includes downtown San Francisco and Oakland only). Based on 1980 data, the total population for BART's service area is 2,539,385. This represents a population increase of 4.2% since 1970. Contra Costa County population increased 17.6%, the highest gain for all BART's counties.

The minority population represents 37.8% of BART's total service area. The breakdown by minority group is: Black 14.2%, Asian 11.6%, Hispanic 11.3%, and Native American 0.7%. Since 1970, the greatest population increases were 89.3% for Asian and 64.5% for Native American. Black population increased 18.8% with a 2.9% increase for Hispanics.

The total civilian labor force for BART's service area is 1,296,241. Minority labor force representation is: Black 11.8%, Asian 11.7%, Hispanic 10.3%, and Native American 0.4%.

Median income for BART's service area is \$21,355. Minority group median income is Asian \$23,897, Hispanic \$19,972, Native American \$17,948, and Black \$14,954. Median income for Blacks residing in San Francisco is \$14,269, the lowest minority median income for all counties, while Asians in Contra Costa County have the highest minority median income at \$28,778.

The percent of service area households without an automobile is 18.3%. The Black population has the highest percentage of households without an automobile at 30.5% followed by 22.6% for Asians, 21.4% for Native Americans, and 18.9% for Hispanics.

The most important part of the Title VI assessment is the measurement of travel times and travel costs from a sample of analysis zones which are characterized as predominately minority and non-minority. UMTA establishes travel time standards for specific trip categories (the first six previously listed above). Accessibility is then assessed based on whether selected trips can be made within the accepted standards.

An analysis of accessibility within BART's service area was performed with respect to two sets of transit networks: all transit including BART, and all transit not including BART. The analysis focused on the relative effectiveness of each transit network in accommodating travel between minority/nonminority analysis zones and selected trip destinations (corresponding to the UMTA categories plus trips to downtown San Francisco and Oakland).

The results of this analysis in terms of accessibility and costs are summarized in Table II-4, below.

TABLE II-4
TITLE VI: ACCESSIBILITY AND FARE ANALYSIS

STANDARD TRIP CATEGORY (PURPOSE)	PERCENT OF ALL DESTINATIONS ACCESSIBLE WITHIN STANDARD TIME*		AVERAGE FARE (\$) **	
	MINORITY	NONMINORITY	MINORITY	NONMINORITY
Employment	40.8	41.6	0.60	0.52
Shopping	40.8	27.8	0.54	0.57
Hospitals	33.0	33.0	0.54	0.54
Social Services	18.4	25.3	0.50	0.50
Judicial Courts	40.3	16.7	0.56	0.50
Education	47.6	33.1	0.58	0.55
SF/OAK CBD	63.5	47.3	0.72	0.81

* Established by UMTA guidelines.

** Average fares reflect the fare schedule in effect during 1980.

FY 1985/86 OBJECTIVE STATUS

As of December 31, 1985, BART's work force consisted of 2,275 full-time/active employees, of which 531 (23.3%) are women and 1,127 (49.5%) are minority. The

District's FY 1985/86 Affirmative Action objective for workforce representation is to make progress towards achieving the June 1986 representation objectives for the specific job categories identified in BART's 1983 Affirmative Action Plan. The table on the following page summarizes progress towards achieving the District's work force representation objectives.

Minority and women-owned business enterprise participation for the July-December 1985 period was 16.4%, versus an objective of 21% for the entire year. For federally assisted contracts let during the first half of the year, WBE participation was 3.1%, just above BART's 3% annual objective. DBE participation for federally assisted contracts was 13.2% for the first 6 months of the year, versus an annual objective of 18%.

FUTURE OUTLOOK

Workforce representation for women and other minority groups has improved within recent years with regard to overall percentages and distribution by job group. Progress in achieving the 1986 objectives, as set forth in the 1983 Affirmative Action Plan is summarized in Table II-5 on page II-31A. As indicated in the far-right column, actual representation percentages relative to the objectives have been realized in 5 out of 27 job categories (as indicated by a percentage achieved equal to or greater than 100%). The current plan applies to the period through June 1986. By January 1987, an update of the current plan will be completed which will facilitate progress toward achievement of the remaining program objectives.

In recognition of the wide fluctuation of WBE and DBE participation rates for federally assisted contracts and MBE participation based on all contracts, these Affirmative Action objectives may not be attained during the second half of FY 1985/86. In recognition of this, increased resources will be devoted to monitoring of contract opportunities and identification of qualified minority firms.

PLANNED IMPROVEMENTS

Progress towards achieving workforce representation objectives is addressed in the District's Affirmative Action Plan which includes 13 major activities, of which have been completed as of the end of December 1985.

Table II-5
PROGRESS TOWARDS ACHIEVING BART'S 1983
AFFIRMATIVE ACTION PLAN OBJECTIVES FOR 1986

AFFIRMATIVE ACTION GROUP AND JOB CATEGORY	PERCENT REPRESENTATION AS OF:		JUNE 1986 OBJECTIVE	PERCENTAGE POINT GAIN		PERCENT OF OBJECTIVE ACHIEVED*
	JUNE 1983	DECEMBER 1985		REQUIRED	ACTUAL	
WOMEN						
Executives and Managers	3.9	5.9	10.0	6.1	2.0	32.8
Supervisors/Other	3.1	3.8	6.0	2.9	0.7	24.1
Foreworkers/Transportation	9.1	9.1	12.0	2.9	0.0	0.0
Foreworkers/Other	2.1	4.7	9.0	6.9	2.6	37.7
Engineers	5.7	7.5	10.0	4.3	1.8	41.9
Professionals	37.4	42.8	39.0	1.6	5.4	337.5
Transportation Workers-I/O	23.5	27.6	27.0	4.1	4.1	117.1
Skilled Workers	3.9	5.8	9.0	5.1	1.9	37.3
Semiskilled Workers	19.7	20.0	27.0	7.3	0.3	4.1
Protective Services	16.0	17.5	17.0	1.0	1.5	150.0
Supervisors/Police	11.5	10.3	20.0	8.5	-1.2	-14.1
HISPANIC						
Supervisor/Transportation	9.4	9.7	11.0	1.6	0.3	18.8
Supervisor/Other	4.7	5.3	6.0	1.3	0.6	46.2
Foreworker/Transportation	12.1	12.1	13.0	0.9	0.0	0.0
Engineer	1.9	2.8	5.9	4.0	0.9	22.5
Professionals	5.3	7.9	8.0	2.7	2.6	96.3
Supervisors/Police	0.0	3.4	11.0	11.0	30.4	30.9
ASIAN						
Executives & Managers	3.9	3.9	6.0	2.1	0.0	0.0
Supervisors/Transportation	6.3	6.4	7.0	0.7	0.1	14.3
Foreworkers/Transportation	4.6	4.5	5.0	0.4	-0.1	-25.0
Foreworkers/Other	9.1	10.4	10.0	0.9	1.3	144.4
NATIVE AMERICAN						
Executives & Managers	0.0	0.0	1.0	1.0	0.0	0.0
Supervisors/Other	0.0	0.0	1.0	1.0	0.0	0.0
Foreworkers/Transportation	0.0	1.5	1.0	1.0	1.5	150.0
BLACK						
Supervisors/Transportation	15.6	12.9	16.0	0.4	-2.7	-675.0
Supervisors/Other	9.4	9.4	11.0	1.6	0.5	31.3
Skilled Workers	16.2	15.8	17.0	0.8	-0.4	-50.0

* Objective achievement rating is calculated on the basis of actual percentage points gained (December 1985 actual less June 1983 actual) divided by percentage point gain required to meet objective (June 1986 objective less June 1983 actual). This ratio is then multiplied by 100 to reflect the percent of the objective actually achieved.

PROGRAM AREA OBJECTIVES

8

Objectives for this program area are identified in Figure II-7 below.

Figure II-7

AFFIRMATIVE ACTION PERFORMANCE OBJECTIVES

FY 1986/87

1. Complete an evaluation of District performance in relationship to the 1983/86 Affirmative Action Plan objectives for women and minorities, and develop an updated plan by December 31, 1986 to cover a five-year period.
2. Work to achieve workforce representation objectives for women and minorities in accordance with the 1983/86 plan until the update is completed, and, thereafter, in accordance with the updated Affirmative Action Plan.
3. Work to achieve 21% minority business enterprise participation for all District contracts determined to have MBE opportunities, with 18% DBE and 3% WBE participation for federally assisted contracts.
4. Work to achieve 15% equity participation in District Joint Development Projects by women and minority individuals and/or business enterprises.

FY 1987/88 to FY 1990/91

1. Seek to achieve District objectives for workforce representation of minorities and women for minority business enterprise contract activities.

PROGRAM AREA G: SYSTEM ACCESS

The original BART plan envisioned a major coordination effort and restructuring of local transit routes to provide high levels of access to rail stations. With 113,600 average weekday trips and 17,262 automobile spaces provided when Transbay service began in September 1974, BART parking facilities then averaged a 79% noontime occupancy. July-December 1985 weekday ridership averaged just over 212,500 trips with 6,310 more parking spaces provided now than in 1974. Every parking space in the system, except at Coliseum and Richmond Stations, is typically filled by 9:00 A.M. weekdays.

BART patron access needs in outlying suburban areas are difficult to serve by transit, as past experience has shown. Consequently, the automobile is the most widely used and effective means for travel to BART in these areas. As shown in Table II-5 on page II-34 the District now provides 23,572 automobile spaces at 24 stations, or 36.6% more than when Transbay service began.

Past efforts have included the implementation of innovative alternatives to parking, including: special shuttles, exclusive bus lanes in the immediate vicinity of stations, improved bus waiting areas, interoperator transfers and passes, bicycle racks and lockers, and a car-pool program. All of these have met with varying degrees of success, depending upon their location.

In addition to these access improvements, is the District's express bus service which links the current rail system to outlying areas in Alameda and Contra Costa Counties via prospective BART-served corridors. The periodic Passenger Profile and Latent Demand Surveys have provided detailed access information for both users and nonusers of the rail and express bus system. This information has been utilized to update BART's plans for system access. Further, numerous improvements designed for the special needs of the elderly and handicapped have been implemented over the years (in addition to those originally incorporated into the system), making BART a viable form of transportation for mobility impaired persons. This includes BART Express Buses which are accessible to persons in wheelchairs. The District's Express Bus Program provides service between key BART stations and travel corridors within the District presently not served by rail.

FY 1985/86 OBJECTIVE STATUS

The District's FY 1985/86 objectives for system access focus on improving service in four areas: parking, local bus coordination, BART express bus service, and safety and mobility needs of elderly and handicapped patrons.

Included in the District's system access objectives this year is the addition of 2,826 new parking spaces at existing and planned future rail stations. This objective is based on the completion by June 1986 of five parking projects at existing stations and three park/ride facilities to be located on planned future station sites which are associated with a Pittsburg-Antioch extension. The status for these eight parking expansion projects, in support of 2,826 new spaces this fiscal year, is as follows.

Of the planned 2,826 spaces, 492 (17.4%) were opened to the public during July-December 1985 through completion of two of the four station parking lot redesign projects included in this year's objectives set. In November, 293 spaces were added at Bayfair Station, followed by the December opening of 199 spaces at South Hayward Station.

The remaining two parking lot redesign projects are scheduled for completion during the third quarter this fiscal year. These include Concord Station (204 spaces) to be completed in January and El Cerrito del Norte (514 spaces) in February.

Table II-6
BART PARKING SPACE INVENTORY
(As of December 1985)

CONCORD LINE:		
	Concord	1,771
	Pleasant Hill	1,652
	Walnut Creek	1,263
	Lafayette	1,096
	Orinda	1,096
	Rockridge	776
	SUBTOTAL	7,654
RICHMOND LINE:		
	Richmond	754
	El Cerrito del Norte	1,079
	El Cerrito Plaza	509
	North Berkeley	524
	Ashby	560
	MacArthur	690
	SUBTOTAL	4,116
FREMONT LINE:		
	Fremont	1,525
	Union City	1,166
	South Hayward	1,079
	Hayward	967
	Bayfair	1,761
	San Leandro	1,066
	Coliseum	923
	Fruitvale	787
	Lake Merritt	190
	SUBTOTAL	9,464
SAN FRANCISCO LINE:		
	Daly City	1,877
	Glen Park	58
	Oakland West	403
	SUBTOTAL	2,338
SYSTEM GRAND TOTAL		23,572

Another parking project for South Hayward Station will provide an additional 173 spaces in a new BART-owned parking facility located across Dixon Street from the existing lot. This project is scheduled for completion by May 1986.

Progress for parking expansion at Fremont station includes the advertising for bids for a project which calls for the paving of a gravel lot, connecting the lot to the existing paved facility, and paving undeveloped BART property. Previously scheduled for completion during the current fiscal year, construction for this 405-space project is expected to begin this February with completion by October 1986.

Also called out in this year's system access objectives is the completion of the West Pittsburg (Bailey Road) and East Antioch (Hillcrest Avenue) park/ride facilities. Construction began early this fiscal year for both these projects which are to be linked to Concord Station via BART express bus service. Each facility will consist of a 200-space parking lot and adjacent bus loading areas. The East Antioch facility is scheduled for completion by March 1986 with the West Pittsburg facility to be completed by June 1986.

A third park/ride facility called out for completion in this year's objectives is the North Concord/Martinez project. This 500-space facility is to be located at the intersection of the Port Chicago Highway and SR-4 with a BART express bus link to Concord Station. Negotiations were finalized during the second quarter with the U.S. Navy (the current owners of the property) regarding a lease agreement. It is estimated that an 11-month construction period will be required once agreement is reached and work begins, which is now anticipated to occur during the latter half of the current fiscal year.

Activities addressing the District's 1985/86 objective to improve schedule coordination with AC Transit included the development of an agreement specifying the services to be coordinated. This agreement provides for continued funding of AC/BART coordinated service which was initiated in September 1984.

The District's objective for express bus service is to implement first stage streamlining in all corridors by the end of the current fiscal year. On September 9, 1985, streamlining was implemented for the UP and UL express bus routes which serve the Livermore Valley from both Bayfair and Hayward BART stations. Scheduled travel times for midday service have been reduced and service has been extended to the Hacienda Business Park. Also during the first half of the year, the BART Board of Directors authorized the implementation of first stage express bus streamlining for routes serving the I-680 San Ramon corridor. This service was begun in March 1986. As of December 1985, first stage streamlining has been authorized for all express bus corridors except I-80. Service revisions in the SR-4 and I-80 corridors are currently scheduled for implementation this winter.

The District's objective to implement an express bus flash pass was achieved during the first quarter. On July 1, 1985, patrons began using the new flash pass. The passes may now be purchased, each calendar quarter and are valid for 3-months for one- and two-zone express bus travel, respectively. Effective January 1, 1986, the passes are priced at \$45 and \$69. For those who patronize BART express buses less frequently, a new 20-ticket book became available in August. The cost for non-expirable one- and two-zone books is \$15 and \$23, respectively, effective January 1, 1986.

The District's FY 1985/86 objective relating to access and safety for mobility impaired patrons is to implement and evaluate the first phases for both the Platform Edge and Elevator Modification projects. Testing was completed in November 1985 for the raised platform edges which have been installed in Berkeley, Montgomery, Rockridge, and a portion of Lake Merritt stations. Results of the tests revealed the

surfaces to be readily detectable by vision impaired and blind persons. Completion of the installation of a brightly colored and textured rubber surface for platform edges at Lake Merritt Station is scheduled for January 1986, which will be followed by a further evaluation period.

The Elevator Modification Project at El Cerrito del Norte Station is expected to be completed in January 1986. In addition to the lowering of control panels in order to accommodate patrons in wheelchairs, progress continued with respect to the installation of a card-reader, intercom, closed circuit television, and new call buttons. These same improvements are being installed at Berkeley Station, but are not expected to be completed until after those at El Cerrito del Norte. Evaluation of the elevator improvements at these two stations was completed during the early part of 1986.

FUTURE OUTLOOK

The 1983 BART Latent Demand Study indicates that the current potential market for typical home to work travel is approximately 462,000 people. This population includes all persons who reside within 3 miles of a BART station and commute 5 miles or more to a workplace which is also served by BART. The results of this and the more recent 1985 Passenger Profile Study (which was conducted in May 1985) indicate that system access is clearly a growing problem. Access deficiencies are expected to become even more acute as patronage demand increases in response to service expansion phasing over the next five years.

As noted in Chapter I (see page I-19), with no significant highway expansion programmed within BART served corridors and existing facilities at or near capacity currently, BART with its capacity expansion program, is essentially the only regional transportation facility which will be capable of accommodating substantially higher travel demand in the coming decade. This is particularly true for Transbay travel and other critical highway linkages such as the Caldecott Tunnel. These facilities are at capacity during most of the day with their delay impacts extending to all proximate highways. This increasing level of highway congestion along with very limited downtown parking is expected to result in more and more people looking toward BART as a way of satisfying their travel needs. How these additional people will get to BART is the central focus of the District's programs to improve system access.

The most pressing need in the coming years will be to alleviate BART's growing parking deficiency, estimated by 1988 to be on the order of 13,800 spaces above the current 23,572 space inventory. Under the fare structure effective through December 1985, this deficiency translates into an estimated \$7.2 million annual net revenue loss as a result of access-constrained patronage growth.

Funding is, of course, a critical concern. Progress towards implementing parking expansion projects will subsequently depend upon the District's ability to secure funds through conventional sources as well as through innovative financing methods. One potential funding source is the Revenue Bond Construction Fund, created in the second quarter of FY 1985/86. Funds from this source may be identified to support parking projects listed in the FY 1986/87 - FY 1990/91 District objectives.

In light of the parking deficiency, and the role that access has on system patronage in general, the District must re-examine the ways in which other Bay Area Transit operations, including BART Express Bus service, can be improved to satisfy both local and BART access needs. Cooperative efforts with AC Transit and the BART/MUNI Fast Pass are a major step toward achieving higher levels of coordination of services, fares, and transfers. However, the serious parking deficiency in the Eastbay will continue to constrain ridership until BART's parking expansion program, as outlined in the next section below, can be realized.

BART also recognizes the need to continue to improve system access for mobility impaired persons. The District meets with representatives of the elderly and handicapped community on an on-going basis for the purpose of identifying improvements to increase mobility and safety in stations and on trains. In light of increased attention in this area, the District will need to continue to meet with these representatives as one effective means of improving both accessibility and safety.

Improving the availability of information for transit services in the vicinity of stations is also essential. As a result of the widespread reorganization of AC Transit and MUNI lines and the more recent phasing in of services under the Central Contra Costa Transit Authority, many station area maps located in BART stations are now outdated and need to be replaced with current information. Improvements in these areas are described below with additional detail provided in Appendix C: Interoperator Coordination.

PLANNED IMPROVEMENTS

Projects programmed for implementation in the current 5-year SRTP timeframe are discussed in the following sections. The improvements are divided into four basic groups, each relating to specific modes of travel or special considerations. These are: parking, BART express bus, interoperator coordination, and elderly and handicapped needs.

Parking Improvements

Table II-7 on the following page summarizes the District's parking expansion program to provide 16,766 new parking spaces at existing rail stations. This compares to an estimated 1988 shortage of 15,800 spaces. Of these 16,766 spaces, 2,929 are programmed for completion by June 1986, leaving an uncompleted balance of 13,837 spaces. The realization of this program will increase BART's district-wide parking inventory by 78%, from about 21,500 spaces in March 1983 to about 38,300.

The parking program at existing stations includes 33 projects as follows:

- o 11 Parking Productivity Improvements, primarily consisting of redesign of existing lots to accommodate more automobiles.
- o 10 Surface Parking Expansion Projects
- o 12 Parking Facilities, including multi-level parking structures

Table II- on Page II- summarizes the annual parking space additions programmed through FY 1991/92 by station and line segment. BART expects to add 1,910 new spaces at existing rail stations during the 1986/87 fiscal year. These include surface expansion at Fremont (405 net new spaces) and redesign at Lafayette (220 new spaces), Orinda (150), North Berkeley (80), Fremont (250), Hayward (330), San Leandro (250), and Fruitvale (225). In addition, 545 gravel spaces will be paved at Fremont, and 500 new spaces will be constructed at the North Concord/Martinez park/ride lot, for a total of 2,955 spaces programmed in the FY 1986/87 objective. Information on the North Concord/Martinez project, and other Park and Ride projects is presented separately below in the Express Bus section.

Parking expansion for four additional fiscal years (through 1990/91) is also summarized in Table II-7.

3/24/86

Table II-7
BART PARKING PROGRAM
Incremental Parking Space Additions

	Inventory Mar 1983	New Spaces Mar 1983 Through Dec 1985	New Spaces January Through June 1986	New Spaces Programmed FY 86/87	New Spaces Programmed FY 90/91 to FY 90/91	Unfunded Portion of Program	Cumulative New Spaces Since Mar 1983	Completed Program Inventory
CONCORD LINE:								
Concord	1,223	548	204	0	600	1,200	2,552	3,775
Pleasant Hill	1,566	66	0	0	1,200	0	1,266	2,852
Walnut Creek	1,168	95	0	0	0	1,132	1,227	2,395
Lafayette	1,014	82	0	220	200	700	1,221	2,216
Orinda	1,083	13	0	150	0	500	663	1,746
Rockridge	776	0	0	0	0	0	776	0
SUBTOTAL	6,850	804	204	370	2,000	3,532	6,910	13,760
RICHMOND LINE:								
Richmond	754	0	0	0	200	0	200	954
El Cerrito del Norte	1,054	25	514	0	300	500	1,339	2,393
El Cerrito Plaza	509	0	0	0	150	0	150	659
North Berkeley	504	20	0	80	150	0	250	754
Ashby	560	0	0	0	100	0	100	660
MacArthur	487	203	0	0	0	650	1,340	1,340
SUBTOTAL	3,868	248	514	80	900	1,150	2,892	6,760
FREMONT LINE:								
Fremont	1,525	0	0	655	500	0	655	2,180
Union City	932	234	0	0	800	0	734	1,666
South Hayward	880	199	173	0	300	0	1,172	2,052
Hayward	967	0	0	330	630	0	630	1,597
Bayfair	1,408	353	0	0	80	600	1,033	2,441
San Leandro	1,066	0	0	250	0	0	250	1,316
Coliseum	923	0	0	0	250	0	1,173	250
Fruitvale	730	57	0	225	100	550	932	1,662
Lake Merritt	105	85	0	0	0	400	485	590
SUBTOTAL	8,536	928	173	1,460	2,030	1,550	6,141	14,677
SAN FRANCISCO LINE:								
Daly City	1,877	0	0	0	0	0	0	1,877
Glen Park	0	58	0	0	0	0	58	58
Oakland West	403	0	0	0	775	0	1,178	1,178
SUBTOTAL	2,280	58	0	0	775	0	833	3,113
SYSTEM GRAND TOTAL	21,534	2,038	891	1,910	5,705	6,232	16,766	38,310

BART Express Bus

1. Update on System Access Performance Objectives FY 1986/87

- a) Complete North Concord/Martinez Park and Ride Lot.

A lease between the United States Navy and BART for five acres on which the North Concord/Martinez Park and Ride Lot will be constructed was signed in January 1986. Construction of this project is scheduled to begin in June 1986 with completion slated for November 1986.

- b) Implement first stage of streamlining in West, Interstate 80 corridor of Express Bus system.

Although it was BART's intent to implement Interstate 80 Express Bus streamlining during FY 1986/87, the Western Contra Costa County Transit Authority (WestCAT) has requested that the currently operated level of Express Bus service be retained until substantial progress can be made on a park/ride project in Hercules to which any streamlined bus routes would have to be anchored. Staff is continuing to work with WestCAT and the City of Hercules on this project.

- c) Implement Express Bus/rail ticket.

Progress is continuing to be made toward the development of a single ticket that can be utilized on the BART rail system as well as Express Bus. This ticket should be implemented during the last quarter of the period.

- d) Seek to acquire land for West Antioch and Dublin Park and Ride lots.

BART will soon submit a Section 9 UMTA grant application for funds to develop the West Antioch (Somersville Road) park/ride project. Upon funding approval, negotiations will begin regarding land acquisition.

In February the BART Board allocated Revenue Bond Construction Funds for land acquisition and construction of the Dublin park/ride project. The selection of an environmental consultant to prepare the impact assessment for the Dublin Park/Ride project is now underway. It is anticipated that this assessment will be completed in June 1986 at which time land acquisition negotiations for the park/ride project would proceed.

2. FY 1987/88 to FY 1990/91

- a) Complete freeway off-ramp bus stops at Livorna and El Cerro Road along the Interstate 680 corridor.

Local jurisdiction coordination is continuing on this project. Meetings have been held with city staff in Danville regarding the El Cerro project. It appears that implementation of this project may be delayed at the request of the City of Danville since the City desires to extend El Cerro Road prior to having BART implement a freeway bus pad express stop.

b) Pittsburg Park/Ride

Staff is investigating land ownership and availability of parcels that might be appropriate for the Railroad Avenue project.

c) Hercules Park/Ride

BART staff is holding a series of coordination meetings with City of Hercules staff to decide upon a specific BART station and park/ride site, resolution of this issue is expected to be clarified prior to the summer of 1986.

d) Implement second stage streamlining in all Express Bus corridors

The incremental Express Bus streamlining plan outlined in Table II- identifies an improvement schedule which enables local transit operators to take over the locally oriented service now being provided by BART. Since none of the local operators in the Express Bus corridors are in a position to take over the seven day, 6:00 A.M. to midnight level of BART bus service being provided at this time, it is proposed that the transition be made first for weekday service, then for Saturday service, and finally late evening, weeknight, and Sunday service.

Interoperator Coordination

Efforts to improve the coordination of BART service with other Bay Area transit operators have been intensified, particularly beginning in early FY 1984/85 when the AC/BART purchase of service agreement became effective. This, and other related coordination efforts, recognizes the need for improving transit access to BART as an alternative to access by automobile which is already constrained (for patrons requiring parking at stations).

Planned coordination efforts have been included in the Patronage and Travel Promotion section beginning on page II- , since improvements in this area are believed to be an effective means of stimulating additional ridership for BART as well as for other transit operations providing service to BART stations. These and other improvements yet to be identified are part of the Regional Transit Association (RTA), Regional Transit Productivity Committee (RTPC), and 842 processes which focus on maximizing transit services, performance, and financial standing on a regional basis.

As part of the above processes, the District plans to implement improvements in the upcoming five-year timeframe for the purpose of enhancing BART service relative to connecting services provided by other Bay Area operators. These include:

- o Ongoing evaluation and analysis of AC bus routes serving BART stations for the purpose of maximizing ridership and revenues to both operators.
- o Similar ongoing evaluation of BART Express Bus and Shuttle services as above.
- o AC Transit operations with the start-up of implementation of the selected program now anticipated to occur in January 1986.
- o The AC/BART joint ticket is scheduled to become available for use on both systems starting in January 1987 for a 6-month demonstration period ending June 1987. BART faregates will be capable of processing this new ticket which will also serve as a pre-payment mechanism for AC riding (in the same manner as the BART/MUNI Fast Pass).
- o Ongoing discussions with AC Transit and CCTA for the purpose of extending the "Bus Light" program to include additional bus routes which connect at stations currently equipped with this system
- o Installation of a Passenger Information Center at 12th Street Station early in FY 1986/87, as part of a three-phase program to improve the availability of information for connecting transit service. Phase II is to be implemented over the upcoming two years and will include all designated regional transfer stations. Based on an evaluation of Phase I and II, expansion of this program to remaining BART stations may be implemented as a third phase.

TABLE 11 EXPRESS BUS STREAMLINING PLAN

EAST CORRIDOR

TIME PERIOD	EXPRESS BUS SERVICE DESCRIPTION	PP HEADWAY	MID HEADWAY	EVE	SAT	SUN	TT	COMMENTS
Current	P- Port Chicago-Hwy to Antioch	8 daily tps	No service	-	-	-	50	30 stop locations
	P1- Port Chicago Hwy to Brentwood	1 trip	3 trips	-	-	-	73	73 stop locations
	PX- Highway 4 to Antioch	30 minutes	60 minutes	-	-	-	50	28 stop locations
	P1X-Highway 4 to Brentwood	60 minute	60 minutes	-	-	-	68	65 stop locations
	P2X-eve/w'end serv to Pitt-Brent	No service	No service	60	60	60	90	89 stop locations
March 1986	P-E Concord to Brentwood	15 minutes	30 minutes	-	-	-	60	20 stop locations
	P2X Concord to Brentwood	No service	No service	60	60	60	90	89 stop locations
Upon completion of park/ride lots	P-E Concord to Antioch	15 minutes	30 minutes	-	-	-	60	Stops only at Park/Rides at Hillcrest, Bailey Road and North Concord (and Somersville and Railroad P/R when completed).
	P2X Concord to Brentwood	No service	No service	60	60	60	90	

PP = Peak period (6:00 a.m.-9:00 a.m., 4:00 p.m.-7:00 p.m.)

MID = Mid-day

EVE = Evening (7:00 p.m. - 12:00 midnight)

SAT = Saturday

SUN = Sunday

TT = Travel times

All times in minutes

TABLE II EXPRESS BUS STREAMLINING PLAN
CENTRAL CORRIDOR

3/24/86

TIME PERIOD	EXPRESS BUS SERVICE DESCRIPTION	PP HEADWAY	MID HEADWAY	DAILY HOURS	ONE-WAY TRAVEL TIME	COMMENTS
Pre-March 1985	Weekday D Route - W.C. BART to Stoneridge via Dublin on I-680 Frontage Road	30 minutes	30 minutes	95	61 minutes	57 stops for all levels of service
	Saturday D Route - W.C. BART to Stoneridge via Dublin on I-680	45-60 min.	45-60 min.	46	61 minutes	
	Sunday D Route - W.C. BART to Stoneridge via Dublin on I-680 Frontage Road	60 minutes	60 minutes	39	61 minutes	
	Supplemental Service					
	MX	1 AM/1 PM		3	21 minutes	
March 1985	Weekday M Route - Concord BART to Martinez via local streets	30 minutes	30 minutes	50	43 minutes	46 stops for all levels of service
	Sunday M Route - Concord BART to Martinez via local streets	60 minutes	60 minutes	27	39 minutes	
	Supplemental service					
	ME Express svc. via Alhambra Av., Hwy 4 & I-680-Martinez to Concord	30 minutes	No service	32	25 minutes	
	ME Saturday evening service 6 PM to midnight			12	25 minutes	
March 1986	ME Sunday service	60 minutes	60 minutes	17	25 minutes	I-680 Corridor service with Frontage Road segment between Livorna Road and Stone Valley Road and Diablo Road and Sycamore Valley Road. Also serves Bishop Ranch and Dublin.
	DXI freeway with some local service - Walnut Creek BART to Stoneridge. Route will also operate weekday evenings at 60 minute headways	30 minutes	30 minutes	63	40 minutes	
	D local service - Walnut Creek BART to Dublin, weekend service Saturday	45-60 min. 60 minutes	45-60 min. 60 minutes	46 39	61 minutes 61 minutes	
	DX freeway express - Walnut Creek BART to North Pleasanton	30 minutes	No service	32	50 minutes	
	DXI freeway express - Walnut Creek BART - Stoneridge	30 minutes	30 minutes	63	32 minutes	
September 1986						Same routing as current D route Same routing as current D route I-680 corridor service off freeway for Crow Canyon Road. I-680 Corridor service with Frontage Rd. segment between Livorna Rd. and Stone Valley Rd. and Diablo Rd. and Sycamore Valley Rd. Also serves Bishop Ranch and Dublin. Frontage Rd. segments will be eliminated when freeway off-ramp bus stops at Livorna and El Estero are completed.

TABLE II EXPRESS BUS STREAMLINING PLAN

SOUTH CORRIDOR

TIME PERIOD	EXPRESS BUS SERVICE DESCRIPTION	PP	MID	EVE	SAT	SUN	TT	COMMENTS
Pre-June 1985	U Local Pleasanton, Livermore local service	30	30	60	30	60	55	29 stop locations
	U-L Express service Bayfair to Livermore	30	-	-	-	-	50	9 stop locations
	U-P Express service Bayfair to Pleasanton	30	-	-	-	-	40	18 stop locations
June 1985	UP Bayfair BART to Pleasanton	30	-	-	-	-	40 ⁴	Revised routing via Foothill, Stoneridge, Willow, Las Positas, Santa Rita, Valley, Hopyard, and Dublin Blvd.
September 1985	UL Bayfair BART to Livermore	30	60	-	-	-	50	
	U Bayfair, Pleasanton, Livermore local service	30	60	60	30	60	55	
Upon Completion of Dublin/Livermore Park/Ride	UL Bayfair BART to Livermore	15	30					

PP = Peak period (6:00 a.m.-9:00 a.m., 4:00 p.m.-7:00 p.m.)

MID = Midday

EVE = Evening (7:00 p.m. - 12:00 midnight)

SAT = Saturday

SUN = Sunday

TT = Travel times

All times in minutes

TABLE II EXPRESS BUS STREAMLINING PLAN

3/24/86

WEST CORRIDOR

TIME PERIOD	EXPRESS BUS SERVICE DESCRIPTION	PP HEADWAY	MID HEADWAY	DAILY HOURS	ONE-WAY TRAVEL TIME	COMMENTS
Current	Q Express Bus service from El Cerrito del Norte to Pinole	30 minutes	30 minutes	44	35 minutes	32 current stop locations
	J Express Bus service from El Cerrito del Norte to Rodeo	30 minutes	No service	15	35 minutes	20 current stop locations
	Q Saturday service from El Cerrito del Norte to Pinole	30 minutes	30 minutes	31	30 minutes	

Study is in progress to assess the feasibility of Express Bus streamlining in the I-80 corridor.

PP = Peak period (6:00 a.m.-9:00 a.m., 4:00 p.m.-7:00 p.m.)

MO = Mid-day

EVE = Evening (7:00 p.m. - 12:00 midnight)

SAT = Saturday

SUN = Sunday

TT = Travel times

All times in minutes

Coordination of transit service has a direct impact on how well BART and other operators can respond to an energy crisis. BART's energy contingency strategy reflects efforts carried forth through the Regional Energy Contingency Plan which was published in December 1981. Consistent with this plan, BART will emphasize the need to accommodate commute travel to the San Francisco/Oakland regional core for work purposes. In the event of an energy crisis, the District and other Bay Area transit operators are to jointly implement a public information program to encourage flex-time scheduling and ride-sharing, and also to provide information to the public concerning where and during what hours transit capacity is available. The District will adhere to the Regional Energy Contingency Plan recommendation of joining forces with other transit operators to determine the exact nature and severity of the crisis, identify specific actions needed to address it, and adopt a coordinated action plan for immediate implementation. It is further recognized that BART's ability to absorb additional peak period, peak direction riders much beyond today's level is severely limited until at least early 1988 when all 150 new C-cars are available for service and other key projects completed permit increased on-line capacity.

Additional detail concerning Interoperator Coordination is included in Appendix C which responds to MTC concerns relating to its annual regional coordination evaluation of transit services.

Elderly and Handicapped Accessibility Improvements

BART recognizes the need to continue to improve system access for elderly and handicapped persons. Prior to the start-up of revenue service in September 1972, the system was retrofitted to accommodate special needs of persons in wheelchairs and for other mobility considerations. Numerous system improvements have been made over the years such as the installation of signs on trains indicating priority seating, electronically controlled doors, additional curb cuts, special ramps, close-in station parking, and restroom modifications. These and other improvements have been implemented primarily as the result of deficiencies which were identified by the BART Task Force on Access for Elderly and Handicapped Persons. This citizens group meets regularly with BART staff to discuss the needs of the elderly and handicapped community with respect to BART access and safety.

Projects to be continued or initiated during FY 1986/87 for the purpose of improving accessibility to BART for elderly and handicapped persons include:

- o Design of systemwide self-operation elevator control improvements. Implementation of these improvements at other stations (during Phase II) will depend upon a continuing evaluation of those at Berkeley and El Cerrito del Norte.
- o Completion of secondary station agent booth elevator controls at Civic Center, Embarcadero, Berkeley, and 19th Street Stations.
- o Seek funds for continuing installation of platform edging.

The Task Force on Access for Elderly and Handicapped Persons will focus on reviewing and evaluating the above projects during the upcoming fiscal year. The Task Force will also update its work program which will identify other desired improvements to enhance E&H accessibility.

Specific capital projects and implementation schedules for system access are summarized in Figure II-12 beginning on page II-56.

PROGRAM AREA OBJECTIVES

Revised operating performance objectives for the current SRTP timeframe are identified in Figure II-8 below.

Figure II-8

SYSTEM ACCESS PERFORMANCE OBJECTIVES

FY 1986/87

1. Provide 2,955 BART-owned parking spaces at existing rail stations and planned future station sites.
2. Seek to acquire land required for surface parking projects on Bond list.
3. Continue to implement schedule coordination between BART and AC Transit.
4. Implement first stage streamlining in the West Corridor.
5. Implement Express Bus/Rail ticket.
6. Implement AC/BART joint ticket.
7. Initiate installation of Phase II of the elevator improvements.
8. Complete evaluation of platform edge project and seek funds for systemwide installation if appropriate.

FY 1987/88 to FY 1990/91

1. Complete parking redesign and surface parking projects.
2. Complete parking facilities at Pleasant Hill.
3. Complete Daly City Intermodal Facility.
4. Complete freeway off-ramp bus stops and the Dublin, West Livermore, West Antioch, Pittsburg and Hercules Park and Ride lots.
5. Implement second stage streamlining in all Express Bus corridors.
6. Complete installation of Phase II of the self-operation elevator control improvements.
7. Complete installation of the platform edge project.

PROGRAM AREA H: JOINT DEVELOPMENT

BART's Joint Development Program is a commitment to the general concept of the cooperative development of station areas with both the public and private sectors. The key focus of this program is the identification and implementation of development opportunities to be pursued with regard to BART-owned and adjacent properties.

Early efforts, generally between 1980 and 1983, focused on establishing overall program guidelines, assessing systemwide joint development opportunities, and initiating cooperative working relationships with local jurisdictions. Results of these efforts include a ranking of joint development opportunities for all 34 stations, an analysis of the risks and benefits for different courses of action regarding the disposition of BART property and cooperative planning efforts with the cities of Oakland, Concord, Walnut Creek, Pleasant Hill, El Cerrito, and Daly City, and Contra Costa County. In several instances, this latter effort resulted in amendments to respective local jurisdiction General Plans allowing for higher density development of BART station areas, while at the same time recognizing the need for the formulation of design/development guidelines for marketing of station area property.

Based on the initial work for this program as well as for related activities for access and extension planning, the District Board of Directors adopted a set of implementation policies in June 1984. The policies emphasize the cooperative development of station areas for the primary purpose of assisting the District in realizing new sources of revenue (i.e.: through long-term ground lease agreements and higher ridership as the result of more intensive use of station area property).

Specifically, BART's Joint Development program seeks to coordinate comprehensive planning and development of existing and future stations. In addition to an expanded revenue base, benefits of this program include the return of real property to local jurisdiction tax rolls, stimulation of the local economy by creating investment opportunities, and encouragement of transit-linked projects as an alternative to dispersed development dependent upon automobile access.

FY 1985/86 OBJECTIVE STATUS

BART's FY 1985/86 objectives for joint development focus on: achieving key planning milestones, negotiating development agreements, implementing a tenant marketing program, and initiating transit center plans.

Consultant selection took place in September 1985 with regard to the market analysis and urban design components for the Richmond Plan. To date, BART and Richmond have been unable to reach agreement on a Joint Planning Agreement.

The District submitted a request for a General Plan Amendment to the City of Fremont during December. This request is part of an effort to secure the City's approval to allow extensive development of District-owned land in Fremont. BART's objective was to secure this approval by the end of the 1985/86 fiscal year. This Amendment was approved in March 1986.

Efforts continued this quarter to reach consensus with the City of Concord regarding development of BART property in Concord. The formal process to secure City approval, originally scheduled to begin in November 1985, has been rescheduled for April 1986 following the March 4, 1986 special ballot election regarding City height limits. The District's objective is to achieve inclusion of BART's development plans in the

City of Concord's urban design guidelines this fiscal year. Reference to development of BART property was deleted by the City prior to adopting its current urban design guidelines. The City of Concord has requested BART to submit its development plans in advance of any City action concerning this property.

Progress also continued towards completing joint planning work for the Daly City Specific Plan (in anticipation of its submittal to the City Council for approval). The plan is expected to be finalized by March 1986 with City Council approval anticipated by June 1986 (versus a District objective to submit the Daly City Specific Plan to the City Council for its approval by the end of this fiscal year).

BART is currently negotiating with several developers for the development of a 200-300 room hotel at the Pleasant Hill Station. It is expected that a ground lease will be signed during the summer of 1986.

With regard to implementing a direct marketing effort aimed at large corporate tenants, the special brochure implemented in September 1985 was mailed to prospective corporations during the first week of October (versus a September 1985 objective date for this effort).

No activity to date has occurred with respect to the District's objective to initiate transit center plans by June 1986 (which assumes necessary land acquisition at West Pittsburg, Dublin, and Warm Springs).

Additional highlights for the July-December 1985 period for joint development include a continuation of discussions with the City of Oakland regarding a joint analysis of development potential for MacArthur Station and its immediate vicinity.

FUTURE OUTLOOK

During the second half of FY 1985/86 Joint Development work will focus on the following:

- o Negotiation of an acceptable ground lease for a hotel project at Pleasant Hill;
- o Submission approval of detailed development plans for the Pleasant Hill office site;
- o Submission of an application for rezoning and development agreement for BART's Concord property;
- o Securing of a general plan amendment and rezoning in Fremont;
- o Exploration of future joint development studies at Hayward, MacArthur, El Cerrito, Coliseum, and Lafayette;
- o Resolution of outstanding issues in joint planning agreement with Richmond;
- o Negotiation of acceptable special entrance agreements for the 5th and Market (San Francisco Center) Project and the 388 Market Street project.

PLANNED IMPROVEMENTS

Joint Development efforts will continue to focus on completing work already initiated and to achieve the overall intent and objectives of this program area. The three-phased approach which has been developed consisting of pre-development planning followed by site marketing and property disposition, will continue to be used. Planning work will focus on Fremont, MacArthur, Concord, Hayward and selected other stations. Marketing efforts will focus on Pleasant Hill, Lake Merritt and Concord Stations.

Efforts will focus on providing support to extension planning activities, specifically at Warm Springs, West Pittsburg and Dublin extension stations. A companion effort will be the monitoring of development trends within extension corridors as well as along existing routes. Additionally, support will be given to the area of expanded station parking.

It is anticipated that negotiations regarding special entrances to Powell Street Station will take place in response to projects currently underway directly above this subway station. Market strategies are to be developed, including ones which address non-station oriented properties.

PROGRAM AREA OBJECTIVES

Updated performance objectives for BART's Joint Development program are identified in Figure II-7 below.

FIGURE II-7

JOINT DEVELOPMENT PERFORMANCE OBJECTIVES

FY 1986/87

1. Complete station area plans at Fremont and Concord.
2. Assuming local government interest and cooperation, initiate station area planning at two of the following stations:

El Cerrito Plaza
El Cerrito del Norte
Hayward

Orinda
Lafayette

Union City
Coliseum

3. Continue "anchor tenant" and master developer marketing efforts focusing on Pleasant Hill, Concord, and Lake Merritt.
4. Assuming favorable market conditions, negotiate an acceptable ground lease agreement at at least one of the above sites.
5. Negotiate an acceptable special entrance agreement for the Fifth and Market project at Powell Street.
6. Seek to develop additional special entrances.

FY 1987/88 to FY 1990/91

1. Continue station area planning efforts in preparation for marketing specific sites for development.
2. Market specific sites as market conditions and local plans permit.

PROGRAM AREA I: EXTENSIONS

The original BART plan included a multi-phased program to provide rail service well beyond areas presently served. The withdrawal of San Mateo and Marin counties prior to the 1962 bond election resulted in voter approval of 71-mile basic system in the current three-county District and indefinitely postponed further development of the rail system. Over the years, the District has continued to coordinate expansion plans with local agencies while investigating the full impacts of extending the system. Extension plans have received intensive public and private review, and they continue to be revised and updated in response to regional growth and changing economic conditions. The District's adopted extension policy is summarized on page II-51.

Figure II-10

ADOPTED BART EXTENSION STAGING¹

WITHIN CURRENT THREE-COUNTY DISTRICT PRIORITY

- I. North Concord/West Pittsburg
 - Irvington/Mission
 - Castro Valley/Dublin
 - San Francisco Airport²
- II. Pittsburg/West Antioch/East Antioch
 - Pleasanton/West Livermore/East Livermore
 - San Francisco³
 - I-80 Corridor (Partial)
- III. San Francisco³
 - I-80 Corridor (Partial)
 - San Ramon Corridor

OUTSIDE CURRENT DISTRICT (Subject to a satisfactory cost-sharing arrangement)

- I. Serramonte/Tanforan
- II. Millbrae
- III. Burlingame/Menlo Park/Palo Alto/San Jose

1. The several segments shown under each Roman numeral are understood to be implemented concurrently.
2. In accordance with Resolution No. 3095 adopted by the District Board of Directors on February 1, 1984, BART supports the establishment of a people-mover, or some other mode of travel, to the Oakland Airport before or at the same time that an extension of BART is built to San Francisco Airport.
3. San Francisco has a BART commitment for a northwest corridor extension or an equivalent project.

As an interim measure until extensions can be constructed, BART provides Express Bus Service between key transfer stations and regional travel corridors in the District not presently served by rail as described under System Access (see pages II-39 through II-44).

Past study has identified BART extensions to serve regional transit needs in four travel corridors located in the current three-county District: Pittsburg-Antioch, Warm Springs (Fremont), Livermore-Pleasanton, and the West Contra Costa I-80 corridor. In addition to these corridors, BART has also been investigated as a potential regional transit improvement in the Bayshore (US 101) corridor in San Mateo and Santa Clara Counties and in the Nimitz Freeway (I-880) corridor in Santa Clara County. These latter two extensions, however, involve resolving the issues of extending BART outside the three-county District priority.

FY 1985/86 OBJECTIVE STATUS

The District has four objectives for extension service and capacity this fiscal year. These focus on: land parcel acquisition, grant sources and applications, local community coordination, and the alternatives analysis/draft environmental impact requirements.

In the area of land parcel acquisition, three parcels were acquired by BART during the July-December 1985 period. Two of these parcels are for the Irvington Station as part of the Warm Springs extension. The third parcel acquired is for the track alignment for this same extension. As of December 1985, this brings the total number of parcels acquired to 12, or 44% of the 27 required for the priority I portion of BART's Extension Right-of-Way and Facilities Program (for additional details, see Table II-7 on page II-33).

With regard to grant sources and applications, the District submitted an application to Caltrans in October for the funding of BART's Priority I Extension Right-of-Way and Facilities Program.

Efforts continued to coordinate extension plans with local community public and private interests. The ongoing Livermore-Pleasanton Extension Study Supplemental Analysis is reviewing potential alternative alignments between the District adopted Dublin Station location and the proposed East Livermore Station and Storage Yard. A community meeting was conducted in August to receive public input concerning possible Livermore Valley alignments. An interim report was completed in October and made available to public agencies and local community groups for review and comment. This report contains a description of the conceptual design features of the most recently identified route alternatives for this extension. Activities are also coordinated with the Fremont-South Bay Policy Advisory Committee and Technical Advisory Committee with respect to the Warm Springs extension. The District has had contact with and has advised developers of current plans for extending the system to Warm Springs.

Coordination with transportation planning in the West Bay focused on the formation of a Joint Powers Agreement with representatives from the State, transit districts in San Mateo and Santa Clara counties, the City of San Francisco, and BART. This was a key recommendation of the Peninsula Mass Transit Study which was completed in July 1985. Additionally, the November 5, 1985 election in San Mateo County on a Serramonte/Colma Station resulted in 73% voter approval for use of San Mateo County funds for this one-station extension.

Table II-9
ACQUISITION STATUS FOR PHASE/PRIORITY I

EXTENSION LAND REQUIREMENTS (As of December 31, 1985)					
<u>STATION SITE OR ALIGNMENT</u>	<u>EXTENSION CORRIDOR</u>	<u>TOTAL REQUIRED</u>	<u>NOT YET ACQUIRED</u>	<u>ALREADY ACQUIRED</u>	<u>UNWILLING SELLER</u>
East Antioch Station	Pittsburg-Antioch	5	0	4	1
West Pittsburg Station	Pittsburg-Antioch	2	0	2	0
North Concord Station	Pittsburg-Antioch	1	1*	0	0
Castro Valley Station	Livermore-Pleasanton	2	0	2	0
Dublin Station	Livermore-Pleasanton	6	3	0	3
Irvington Station	Warm Springs	7	3	3	1
Warm Springs Station	Warm Springs	1	1	0	0
Track Alignment, Irvington	Warm Springs	3	1	1	1
GRAND TOTAL		27	9	12	6

* Lease with Navy signed by BART and Navy in January 1986.

Efforts also continued towards achieving the District's extension objective which calls for the initiation of the alternatives analysis/draft environmental impact requirements for BART's Phase I extension staging policy. During the July-December 1985 period, the following workscopes were submitted to the Urban Mass Transportation Administration for its review and approval:

- o The Pittsburg-Antioch Corridor Alternatives Analysis/Environmental Impact Study/Environmental Impact Report.
- o The Fremont-South Bay Corridor Alternatives Analysis/Environmental Impact Study/Environmental Impact Report (this was formally submitted by the Metropolitan Transportation Commission and includes a Warm Springs BART extension.

FUTURE OUTLOOK

Extension planning activities for the remainder of the 1985/86 fiscal year are expected to focus on the initiation of the Alternatives Analysis/Draft Environmental Impact Requirements for Phase I of the Extension Staging Policy. Efforts will continue in negotiating the acquisition of extension sites as identified in the Extension Right-of-Way and Facilities Expenditures program. BART will also continue to work with local communities, developers, and property owners to maximize coordination during the development process. Additionally, BART will pursue completion of the Livermore-Pleasanton Extension alignment evaluation between Dublin and Livermore.

PLANNED IMPROVEMENTS

Extension planning efforts within the current five year SRTP timeframe will focus on completing the Alternatives Analysis/Final Environmental Impact Requirements for Phase I of the BART Extension Staging Policy. Concurrent efforts will focus on extension rights-of-way through continued implementation of the Extension Right-of-Way Acquisition Program. Partial funding for this purpose has been provided through a capital allocation from the District's operating budget. An additional task will determine the location of four West Contra Costa County extension stations.

PROGRAM AREA OBJECTIVES

The performance objectives for this program area are identified in Figure II-//below:

FIGURE II-//

EXTENSIONS PERFORMANCE OBJECTIVES

FY 1986/87

1. Assist the Metropolitan Transportation Commission and SCCTD in completing the Preliminary Draft Alternatives Analysis/Draft Environmental Impact Document for the Fremont-South Bay Corridor by June 30, 1987.
2. Pursue acquisition of all sites as identified in the Extension Right-of-Way and Facilities Expenditures program within available funding by June 30, 1987.
3. Complete the Preliminary Draft Alternatives Analysis/Draft Environmental Impact Document for the Pittsburg-Antioch Corridor by June 30, 1987.

FY 1987/88 to FY 1990/91

1. Continue to implement the Extension Right-of-Way Acquisition Program.
2. Complete the Alternatives Analysis and Final Environmental Impact Requirements for Phase I of the BART Extension Staging Policy.

FIGURE II-12
1986 FIVE-YEAR PLAN
CAPITAL PROJECT LIST

PROJECTS WITH SCHEDULED COMPLETIONS

FMS #	PROJECT NAME	COMPL DATE
27EB	REPL FIELD COMPUTERS-DAS (PHI)	04-86
91FD	UNDRGRD VENT STUDY-SYSTEMWD	06-86
07C-	KE TRACK (KET)	02-86
41BG	BRAKE GRID HEAT SHIELDS	09-86
41EI	VEHICLE FIRE HARDENING	09-86
15AY	FAN CONTROL SAFETY ENCLOSURES	02-86
17FD	BLDG MODS-STREET/ELEC/MECH-STB	01-87
17BR	1985 BPS OFF. & SPACE MODS-LMA	03-87
61--	INTEGRATED CONTROL SYSTEM -ICS	10-87
79AC	NEW VANS FY 86/87	09-87
79B-	REPL OVERAGE SED/MNT VEH (84/6)	09-87
27CB6	RADCCM	10-87
03PJ	AD*L ATC WORK SPACE @ TC RM-COY	01-87
05NJ	AD*L ATC WORK SPACE @ TC RM-RIY	01-87
20AD	E-O-LINE MAKES & BREAKS	01-87
01XG	PERM IMPS/CALTRANS LOT-FMS(I)	02-87
09FE	RPLC PCB TRANSFCRMR @ SF VENT	11-87
42--	2ND GEN TRANSIT VEHICLES/ATC	05-87
42AA6	150 2ND GEN TRANS VEH W/PRO ATC	05-87
11--	DALY CITY TURNBACK & YARD PRGJ	06-88
11CH	M87 INTERLOCKING	06-88
41GB	2ND GENERATION ATO/136 A-CARS	11-88
15AZ	WET STANDPIPE & FD CMNS-21 STA	05-88
45BF	IBM TICKET TRANSPORT RETROFIT	03-89
0--K6	PARKING CAPACITY EXPANSION	11-89
15LC6	ESCALATOR REHABILITATION PRG6.	02-90
20--	WAYSIDE TC & SYSTEM PERFOR MODS	06-90
0-B-6	EXTENSIONS R.O.W. ACQUISITION	06-97

FIGURE II- (Continued)
1986 FIVE-YEAR PLAN
CAPITAL PROJECT LIST

PROJECTS WITH SCHEDULED COMPLETIONS

FMS #	PROJECT NAME	COMPL DATE
45CB	M ^B RETROFIT - CUBIC AFC	08-86
17CG	PRKG LOT PAVING, STORG AREA-OSA	10-86
03CI	TEST 34.5 KV SUBTRANSM LINE-CLN	04-86
45AH	AC/BART/MUNI SUPER PASS	01-86
11II	RESTRCDM ACCESS MODS - CCS	03-86
15CL	RAIL REPL PH V (86/7)	06-86
45AC	EXPAND AFC DAS CAPABILITY	06-86
03FD	FIRE MAIN MODIFICATIONS(BHT)	07-86
79MC	RAIL TRANSPORT BUGGIES	08-86
15BF	STATION PIGEON CONTROL	09-86
79AD	NEW PICKUPS FY 85/86	09-86
03FK	2ND PWR TRANSFORMR/E.PORTL-EHT	10-86
79B-	REPL OVERAGE SED/MNT VEH (82/4)	12-86
79ME	TRACK GEOMETRIC ANALYSIS CAR	12-86
03CH	34.5 KV SUBTRANSM LINE MODS-CLN	06-86
27BB	COMMUNICATNS CABLE NETWORK-CCN	10-86
27RB	PLATFORM CCTV-DOWNTOWN STATNS	12-86
04MA	200-SP HILLCREST AV P/R LOT-ANS	01-86
91FC	EMERG VENTILATION-OAK WYE(KWY)	01-86
20FE	PERMANENT B-POINTS	02-86
04GA	200-SP BAILEY RD PK/RD LOT-ANS	03-86
03CG	WET STANDPIPE WALNUT CK TUNNEL	03-86
11IG	REPLACE SECURITY DOORS-CC STA	03-86
44DC	REPLACE AFC EQUIP. COMPONENTS	04-86
11FH	STA VENTILATN FAN CONTRCL MODS	05-86
79--	REPL MAINT EQ (82/4)	10-86
27QB	PLATFORM PA EXT ABOVE GRD STAS	11-86
41JG	NEW DBL POSITIV PLATE BATTERIES	03-86
64BD	MIS COMPUTER UPGRADE-TRDWSFTW	01-86

FIGURE II- (continued)
1986 FIVE-YEAR PLAN
CAPITAL PROJECT LIST

PROJECTS w/ COMPLETION DATES ONCE FUNDED

FMS #	PROJECT NAME	CCMPL DATE
01QF	836-SP PKG EXPAN/PH II-SHS(XR)	18MCS
01RM	EXPAND TRANSPORTATION BLDG-HAY	20MCS
03LG	FRINGE PKG FACILITY -WCS (I)	44MOS
03PH	EXPAND TRANSPORTATION BLDG-CCY	20MCS
04DA	BUS STATN PARKRIDE LOT-NCM(XR)	11MCS
05NF	EXPAND TRANSPORTATION BLDG-RIY	20MCS
06KA	200-SP PRKRD LOT/PH I -HRS(XR)	11MCS
06KB	300-SP PRKRD LOT/PH II-HRS(XR)	04MOS
08KA	BUS TRANSFR/PARKRIDE LCT-WLV(XR)	15MOS
10AJ	1680 XPRS-BUS CN-RAMP PADS-SLRN	20MCS
11FG	2 END STAIRWAYS-PLATF/MEZZ-EMS	19MCS
15CM	2ND FAIL REPL PROG (I) FY 87/88	16MOS
15EG	ELECTRICAL CAPACITY IMPROVEMENT	41MCS
15EX	PG&E RATE EVALUATN/ALT SOURCES	06MOS
15NG	SELF OPERATOR-ELEVATORS/HNDICPD	15MOS
20HD	ADD'L STATION ESSENTIAL POWER	14MCS
79--	REPL MAINT EQ (84/6)	31MCS
79AC	NEW VANS FY 87/88	6 MCS
79AD	NEW PICKUPS FY 87/88	6 MCS
79DA	NEW HI-RAILERS - GEN FY 87/88	12MCS
79DA	NEW HI-RAILERS - GEN FY 86/87	18MOS
79IV	VACUUMS & SCRUBBERS FY 85/86	9 MCS
XXXX	DALY CITY INTERMODAL FACILITY	42MCS
XXXX	PLEASANT HILL STA JOINT DEV PJS	03MCS

FIGURE II- (Continued)
1986 FIVE-YEAR PLAN
CAPITAL PROJECT LIST

PROJECTS WITHOUT COMPLETION SCHEDULE

FMS #	PROJECT NAME	COMPL DATE
0---E	BART SYSTEM EXTENSIONS	TBD
01EE	435-SP PRK FAC-LMS	TBD
01GG	ALAMEDA PARKRIDE LOT FVS	TBD
01MG	200-SP SOUTH PKG EXPAN-BFS(IV)	TBD
01VG	500-SPACE SATELLITE LCT-UCS(II)	TBD
02AC	FREMCNT-S. BAY STUDY & AA/EIS	TBD
03JE	PERM IMPVT/CALTRANS LOT-LAS (I)	TBD
03NE	1200-SP.WEST LOT EXPANS-PHS(I)	TBD
03NG	1600-SP. PEPLACEMENT PKG-PHS(I)	TBD
04AC	EIR & PREL ENGRG/P-LINE PH I	TBD
05MD	COMPLETE WEST END OF LCT (RIS)	TBD
08GA	1400-SP PK/RD LCT W/BRIDGE-CUB	TBD
11ED	100-SPACE PARKNG EXPAN-OWS(II)	TBD
11TD	SHOP FACILITIES - ODY	TBD
15AK&	EMPLOYEE BREAKROOMS AT STATIONS	TBD
15N-	PH IV SYSTM ACCESSIBILITY IMPS	TBD
20AE	NON E-O-LINE MAKES & EREAKS	TBD
21Eb&	ACI SYSTEM IMPV - YARDS (PH II)	TBD
79--	REPL MAINT EQ (86/8)	TBD
79--	REPL MAINT EQ (88/90)	TBD
79B-	REPL OVERAGE SED/MNT VEH(86/8)	TBD
79B-	REPL OVERAGE SED/MNT VEH(88/9)	TBD
98DD	REGIONL EMERGENCY TRAIING PROGRAM	TBD
XXXX	AERIAL BARRIERS- PH I&II	TBD
XXXX	SYSTEM SAFETY UPGRADE-PH IIIREM	TBD
XXXX	COURTESY PHONE BACKUP ANS CAPAB	TBD



CHAPTER III

FIVE YEAR FINANCIAL PLAN

Given the foregoing identification of specific performance objectives for the five-year period, it is the purpose of this chapter to identify the financial requirements for implementing proposed improvements and service expansion, to highlight problems limiting implementation, and to recommend feasible solutions in the form of a five-year financial plan. This chapter is comprised of two sections, focusing first on the operating budget projections and then on capital budget projections. Underlying assumptions are presented within each of these sections. Summary financial projections are then shown in tabular form. Problems resulting from the projections are highlighted and proposed solutions discussed.

FIVE-YEAR OPERATING BUDGET PROJECTIONS

The District's five-year operating budget projections are based on the tentative FY 1986/87 budget. The District's five-year operating budget projections appear in Table III-1.

FY 1986/87 OPERATING BUDGET

The tentative operating budget for FY 1986/87 has been developed to meet the previously described goals and objectives. Year-to-year comparisons below are in terms of the adopted FY 85/86 budget.

The budget anticipates net fare revenues of \$84.2 million with a rail farebox ratio of 52.3%, and other operating revenues of \$7.8 million, resulting in an operating ratio of 53.2%.

Property Tax receipts are estimated at \$6.75 million, and Sales Tax receipts are forecast at \$88.9 million.

Operating Expenses are anticipated to increase by \$9.2 million (5.6%) over the FY 1985/86 budget with a total of \$173.1 million for the year.

Net labor cost is expected to increase, \$5.9 million, (5.5%). Labor cost is based primarily on contractual wage and salary increases, plus the increased cost of providing existing fringe benefits. Approximately \$0.6 million of this increase is due to the planned expansion of peak and offpeak service as noted above.

Total nonlabor cost is expected to increase by \$3.3 million (5.9%), as follows. The cost of the Express Bus and Shuttle Program is expected to increase by \$0.6 million. New initiatives to make this program more financially effective are expected to continue during FY 1986/87. The purchase of feeder service from AC Transit is expected to cost \$5.775 million.

Traction/Station Power cost is expected to be \$0.8 million higher than the cost budgeted for FY 1985/86. Of the projected increase, about \$0.5 million is for additional peak and offpeak service. Other nonlabor expense is expected to increase by \$1.8 million; \$0.1 million is associated with new service.

TABLE III-1

1980 DRAFT FIVE-YEAR OPERATING BUDGET FINANCIAL PROJECTIONS
 ASSUMES 15% FARE INCREASE JANUARY 1, 1989
 (\$ 000)

	Actual 1984/85	Budgeted 1985/86	Projected 1986/87	Projected 1988/89	Projected 1989/90	Projected 1990/91
1 Net Rail Revenue: Normal Growth/Offpeak Marketing	66,441	77,308	82,159	84,314	92,144	98,272
2 Net Rail Revenue: New Peak Load Point Demand	0	0	951	1,877	5,228	6,611
3 Express Bus Revenue	1,027	1,320	1,099	1,453	2,060	2,122
4 Net Passenger Revenue	67,468	78,628	84,210	87,644	106,942	111,074
5 Interest Earnings	5,453	6,243	6,240	5,500	4,800	4,000
6 Fiber Optics Joint Venture Income	0	80	81	137	230	250
7 Other (Advertising, Concessions, Etc.) Revenue	1,395	1,739	1,510	1,670	1,847	1,936
8 Other Operating Revenue	6,848	8,062	7,851	7,307	6,788	6,186
9 Net Operating Revenues	374,316	\$86,690	\$92,040	\$94,951	\$113,529	\$117,860
EXPENSES						
10 Net Labor - Current Service 185/86 Base + Additional Base)	100,617	107,935	113,269	116,236	126,146	133,178
11 Net Labor - New Peak Direction Service	0	0	360	2,866	4,820	9,029
12 Net Labor - Additional Offpeak Cermille Expense	0	0	224	414	622	744
13 Electric Power - Current Service	17,936	21,261	21,576	25,071	26,951	28,973
14 Electric Power - New Peak Direction Service	0	0	130	1,016	2,433	5,068
15 Electric Power - Additional Offpeak Cermille Expense	0	0	395	681	761	883
16 Purchased Transportation - Express Bus	6,708	7,127	8,099	8,504	8,929	9,376
17 Purchased Transportation - BART Shuttles	150	256	226	238	249	262
18 Purchased Transportation - Feeder Service	5,065	5,300	5,775	6,064	6,367	6,685
19 Other Nonlabor - Current Service	18,668	21,217	22,960	23,947	25,064	26,292
20 Other Nonlabor - New Peak Direction Service	0	0	10	265	551	1,163
21 Other Nonlabor - Marketing & Extra Offpeak Cermille Expense	0	0	75	169	295	460
22 Total Operating Expenses	\$147,144	\$163,896	\$173,099	\$187,469	\$203,189	\$221,514
23 OPERATING DEFICIT	(172,828)	(77,206)	(81,059)	(92,518)	(90,059)	(107,983)
FINANCIAL ASSISTANCE						
24 Property Tax Revenues	5,734	6,437	6,750	7,155	7,584	8,039
25 Sales Tax Revenues (BART 75% Share)	81,055	86,120	88,856	94,167	99,839	105,879
26 TOA ("BART Only")	300	364	348	398	422	474
27 STA, Other State Funds	5,846	1,941	2,899	2,421	2,566	2,720
28 BART Service Allocations	(6,222)	(9,342)	(13,800)	(15,800)	(15,750)	(15,630)
29 Capital and Other Allocations	(10,301)	(6,315)	(4,305)	(4,594)	(4,730)	(5,087)
30 Total Financial Assistance	\$372,412	\$377,205	\$400,748	\$465,767	\$495,980	\$503,121
31 NET FINANCIAL RESULT	(416)	(1)	(311)	(6,750)	(9,079)	(16,172)
32 NET OPERATING RESERVE	\$5,744	\$5,328	\$5,327	\$5,015	\$-1,735	\$-22,419
33 Ending Balance	\$5,328	\$5,327	\$5,015	\$-1,735	\$-10,814	\$-36,591

* Must equal or exceed \$5.0 million including allowance for 2% Sales Tax Revenue operating reserve. Bond

FINANCIAL INDICATORS									
	Actual	Budgeted	Projected	Projected	Projected	Projected	Projected	Projected	Projected
	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91		
34 Annual Patronage	60,798	61,846	60,423	62,616	63,797	66,248	69,191		
35 Annual Passenger Miles	789,292	801,166	774,616	802,737	817,878	849,299	887,029		
36 Fare Box Ratio: Rail, Normal Growth/Offpeak Marketing	48.4%	51.4%	51.8%	50.0%	51.2%	51.6%	50.0%		
37 Fare Box Ratio: Rail, New Peak Load Point Demand		0.0%	190.4%	45.3%	41.4%	44.9%	55.8%		
38 Fare Box Ratio: Rail, Total, Rail Only	48.4%	51.4%	52.3%	49.9%	50.8%	51.1%	50.3%		
39 Fare Box Ratio: Express Bus Service	15.3%	17.1%	13.6%	17.1%	22.1%	22.0%	21.6%		
40 Operating Ratio	50.5%	52.9%	53.2%	50.6%	51.2%	51.3%	50.1%		
41 Rail Cost per Passenger Mile	\$0.174	\$0.188	\$0.205	\$0.215	\$0.229	\$0.242	\$0.246		
CAPITAL ALLOCATIONS									
42 Revenue Bond Debt Service: 1982/1985 Sales Tax Revenue Bonds	6,826	8,342	12,600	12,600	14,500	14,500	14,650		
43 Sales Tax Anticipation Note Debt Service	1,396	1,200	1,200	1,200	1,200	1,200	1,200		
44 Improvement Allowance	2,900	3,000	3,100	3,200	3,300	3,400	3,500		
45 Planning	401	580	668	697	744	785	830		
46 Joint Development	\$0	\$519	\$737	\$697	\$687	\$721	\$757		
47 Supplemental/Other Capital Allocation	3,000	4,216	0	0	0	0	0		
48 Extension R&M Acquisition	2,000	0	0	0	0	0	0		
49 Parking Facility Construction	2,000	0	0	0	0	0	0		
50 Total Capital Allocations	(18,523)	(17,857)	(18,505)	(18,394)	(20,430)	(20,656)	(20,837)		



Expected receipts of financial assistance through MTC, of \$2.9 million SB 1335 (STA) and \$0.5 million TDA funds are budgeted.

As called for in last year's Five Year Plan, certain capital expenditures are also to be funded from operating sources. Capital Allocations totalling \$18.3 million are budgeted for Improvement Allowance (\$3.1 million), Revenue Bond and Sales Tax Anticipation Note Debt Service (\$13.8 million), Planning and Station Area Development (\$1.4 million). After these allocations have been budgeted, total operating uses exceed sources by \$0.3 million.

ANTICIPATED GROWTH RATES

This section describes the assumptions on which the updated five-year financial plan is based.

Labor is the most significant element of operating costs at 64.6% with all non-labor costs comprising only 35.4% over the next 5-year period. The operating budget plan in Table III-1 identifies two components of labor expense, the current base and that which is required for expanded service. The base includes those positions which are needed to maintain current service. Over the five-year period, some new positions will have to be added for this purpose. However, most of the increase in the base reflects the cost of anticipated improvements in wages and benefits as covered by new contracts which are to be negotiated during this five-year cycle. Maintaining current employee benefits over the five-year period and providing the additional positions needed to continue existing service are also included. The increased cost of these three factors is expected to range from 4.1% to 6.7% annually.

Non-labor expense includes two major items, electric power and purchased transportation (express bus, shuttle and feeder service), and a variety of other lesser items.

The forecasting of future power cost increases is subject to a considerable degree of uncertainty given the large number of influencing factors. These include decisions made at the State and Federal levels concerning atomic power plant certification and international political developments which affect the price and/or availability of oil. Another significant factor is the magnitude of rainfall and thus available hydroelectric resources. The power cost associated with maintaining the current level of service (30,511,000 annual vehicle miles) is expected to increase 1.5% the first year, 16.2% the second year, and 7.5% annually thereafter. Higher than normal rainfall this year and falling fuel prices may significantly reduce the future power cost increases anticipated at this time. These factors need to be carefully reassessed and adjusted if warranted. This review will be carried out after PG&E files its requested energy cost adjustments with the CPUC in early April.

It is anticipated that the Express Bus program will be streamlined during the coming five-year period to improve its financial effectiveness. At this point, it is not clear what the financial impact will be of improved operating performance. Operating costs are projected to increase by an average of 5.0% per year. Shuttle expense is a minor component.

The incremental power cost of planned service expansion is shown in Table III-1. All other nonlabor expense items are expected to increase by an average of 5.0% annually.

BART passenger revenue growth was documented above in Table I-6 (see Chapter I). These estimates reflect the impact of the 30% increase in fares implemented in January 1986 and an assumed 15% increase beginning January 1989. Other operating revenue is expected to be somewhat lower in FY 1986/87 than budgeted in FY 85/86 because of declining interest rates on investment of operating funds.

For the upcoming five-year period, BART sources of financial assistance are forecast to grow at somewhat lower rates than last year's plan assumed. This forecast now anticipates that economic growth will be more moderate than that experienced over the past 12-18 months. Property tax revenues are expected to increase by 6.0% annually. Sales tax yields are likewise projected to expand by 6.0% per year, based on the projected statewide growth of 6.8% forecast by the Commission on State Finance, as adjusted to the historically lower growth rate for the three BART counties.

Discretionary financial assistance which is allocated to BART by MTC is likewise projected at significantly different levels in this year's Five-Year Plan, based on the preliminary allocation estimate furnished earlier this year. This estimate calls for only \$2.9 million of STA funds and \$0.5 million of TDA funds. For purposes of the current financial plan, STA and TDA funds are expected to grow at the rate indicated above for BART sales tax revenues. The STA estimate for FY 1986/87 includes prior year as well as current year allocations. Future STA projections are based on FY 1986/87 current year allocations only.

ADDITIONAL STAFFING REQUIREMENTS

In preparation for the planned increases in service capacity, BART will need to begin expanding its current staffing level to support this change. Most of the increase will occur in the operations departments as the District takes delivery of new revenue vehicles, expands to provide appropriate maintenance, and ultimately puts more cars and trains on line. A few additional positions will be required in administrative and support departments, due to the increased workload produced by increased cash handling volume and new marketing programs.

Table III-2 summarizes new hiring requirements for the five-year period as projected by appropriate departments. The largest increases are in Field Services, Power & Way Maintenance, Finance and Rolling Stock Maintenance. As expected, staffing increases in these departments will be required in anticipation of receipt of the new revenue vehicles and with sufficient lead time for training prior to inauguration of expanded peak period train service.

Table III-2

PROJECTED REQUIREMENTS FOR ADDITIONAL STAFF POSITIONS
 FY 1985/86 - FY 1990/91
 (As of June 30th)

DEPARTMENT	BUDGET 85/86*	INCREMENTAL POSITIONS					SUBTOTAL 5-YEARS	TOTAL 90/91
		86/87*	87/88	88/89	89/90	90/91		
General Manager	5							5
Legal	17	1					1	18
Finance	110	6	3	12	2	2	25	135
District Secretary	4							4
Planning & Analysis	33	1					1	34
Public Affairs	12	0	1	1			2	14
Safety	14							14
Employee Relations	70	2					2	72
Affirmative Action	8							8
Budget & Capital Program Control	15							15
Materials Management & Procurement	70	1	2		9		12	82
Information Systems	34	2					2	36
Administrative Services	36	2					2	38
TOTAL ADMINISTRATION & SUPPORT SERVICES	428	15	6	13	11	2	47	475
Maintenance & Engineering	1202	13	31	17	13		74	1276
Admin. & Maintenance Support	131				1		1	132
Communications & Component Repair	164		8	4			12	176
Rolling Stock Maintenance	323	10	0	0	9		19	342
Power & Way Maintenance	488	0	23	13	3		39	527
Engineering & Construction	96	3						99
Field Services	702.5	12	17	22	25	3	79	781.5
Admin & Support & Analysis	24							24
Train Operations	304	8	4.5	12	18		42.5	346.5
Station Operations	207.5	4	4.5	3		3	14.5	222
Police Services	167	0	8	7	7		22	189
TOTAL OPERATIONS DEPARTMENTS	1904.5	25	48	39	38	3	153	2057.5
TOTAL DISTRICT	2332.5	40	54	52	49	5	200	2532.5
CUMULATIVE INCREASE	--	40	94	146	195	200	200	--

Includes part-time train operators and station agents (one-half position each); does not include part-time EPA's and Cadets.

* Includes positions which are capitalized or otherwise reimbursable.

FIVE-YEAR OPERATING BUDGET PLAN

The five-year operating budget plan is summarized in Table III-1. Actual results for FY 1984/85 are also shown.

The projected operating deficits for the period FY 1987/88 through FY 1990/91 are cause for concern. In view of the slower than previously estimated growth of operating revenues and financial assistance, future cost containment will take on even greater importance than it has to date. The costing rates reflected in these projections are moderate and realistic with the possible exception of the projected rates of increase in power cost. As noted above, the power cost estimates need to be reexamined and some savings should be attainable.

In this presentation, an estimated year-end result is shown for each year. Line 33 represents the District's ending balance in its net operating reserve, or working capital. District financial operations require a working capital balance of \$5 million. The revenue bond covenant requires that a reserve be maintained equivalent to 2% of the following year operating budget. As noted, this will be funded from capital reserves as necessary.

The plan assumes that the revenue bond debt service requirements will be funded each year by an allocation from the operating budget. This and other debt service requirements are summarized in Table III-3.

According to the projections in Table III-1, deficits ranging from \$7-14 million are anticipated in the second through fifth year of the planning period. Note that these estimates include the proceeds of an assumed 15% fare increase in the middle of the third year. Readjustment of power cost projections is expected to improve the net financial result somewhat. However, if actual ridership growth and increases in financial assistance do not exceed current projections, there will be a pressing need for both operating cost efficiencies and possible further revenue enhancements.

Table III-3

FIVE-YEAR PLAN DEBT SERVICE SUMMARY
(000)

	<u>FY 85/86</u>	<u>FY 86/87</u>	<u>FY 87/88</u>	<u>FY 88/89</u>	<u>FY 89/90</u>	<u>Estimated FY 90/91</u>
<u>Debt Service Expense</u>						
General Obligation Bond Interest Redemption	53,840	54,218	54,737	55,200	55,600	56,000
SSD #1 Bond Interest and Redemption	734	735	736	740	745	750
Revenue Bond Debt Service	8,342	12,600	12,600	14,500	14,550	14,650
Sales Tax Anticipation Note Debt Service	<u>1,200</u>	<u>1,200</u>	<u>1,200</u>	<u>1,200</u>	<u>1,200</u>	<u>1,200</u>
Total Debt Service Requirements	\$64,116	\$68,753	\$69,273	\$71,640	\$72,095	\$72,600
<u>Sources of Funds</u>						
General Obligation Bond Interest and Redemption Fund	53,840	54,218	54,737	55,200	55,600	56,000
SSD #1 Bond Interest and Redemption Fund	734	735	736	740	745	750
Allocation from Operating Budget for Revenue Bond Debt Service	8,342	12,600	12,600	14,500	14,550	14,650
Allocation from Operating Budget for Sales Tax Anticipation Note Debt Service	<u>1,200</u>	<u>1,200</u>	<u>1,200</u>	<u>1,200</u>	<u>1,200</u>	<u>1,200</u>
Total Sources of Funds	\$64,116	\$68,753	\$69,273	\$71,640	\$72,095	\$72,600

FIVE-YEAR CAPITAL BUDGET PROJECTIONS

The five-year capital program is the primary means for achieving expanded BART capacity and service level objectives. The capital program is financed from a variety of federal, state, and local grant sources, as well as from the BART operating budget and reserves. The following sections describe the financial requirements for the BART capital program.

The major events affecting this year's capital portion of the S RTP are the Gramm-Rudman-Hollings Act and BART Board approval of the 1985 Sales Tax Revenue Bond Issue. The proceeds from this issue are to be used primarily for parking improvements and park/ride projects.

PROGRAM FINANCIAL REQUIREMENTS

The first step in describing financial requirements is to update cash flow estimates for all projects contained in BART's program. Estimates of annual cash requirements (cash flows) are developed by the project's sponsoring department. The fund source information (fund splits) for funded projects is based on past grant actions. Generally, fund source projections for unfunded projects are based on BART's latest submission to the MTC Transportation Improvement Program (TIP) priority process. Project justifications for FY 86/87 submittals to the MTC Transportation Improvement Program priority process are shown in appendix D.

BART's five-year funded and unfunded capital program is presented in Tables III-4 and III-5 beginning on pages III-11 and III-15, respectively. These tables list all capital projects, their estimated costs, and annual expenditure projections (cash flows). For these projects, the sum of the funded budget and the estimated unfunded portion equals the total project cost. Due to the uncertainty about funding for system extensions, estimated costs for this program are shown separately in Table III-11. Funded and unfunded cash flows by funding source are summarized in Tables III-6 and III-7 on pages III-20 and III-21, respectively.

PROJECTED SOURCES

The primary federal capital funding sources continue to be UMTA Section 3 and Section 9 funds. Section 3 funds come from a trust fund that was created from the 1982 "Gas Tax" legislation. This trust fund provides a dedicated funding source for the transit industry. The Section 9 program, for more routine capital items, is provided through formula grants to local jurisdictions and will cover 80% of a project's cost. BART's split of projects between Sections 3 and 9 is based upon the capital priorities process conducted by the Metropolitan Transportation Commission. Section 3 funds are being provided for 90 new transit vehicles as well as a share of the Daly City Project. The funds shown are as requested in recent negotiations with UMTA. They also reflect the Letter of Intent for the transit vehicles, and the Full Funding Agreement for the Daly City Project. The final delivery estimate will be made once a delivery schedule is established.

The Gramm-Rudman-Hollings Act was passed by Congress in December 1985. This legislation was enacted to produce a balanced budget by 1991. To achieve this, the new law requires reduced federal spending. An across-the-board cut of 4.3% in mass transit funding became effective March 1, 1986. The effect on BART's capital program is that some projects may not be funded. Across-the-board cuts for FY 86/87 may go as high as 20%.

Congress is also considering other changes to UMTA funding. The Reagan Administration has recommended changes in mass transit funding including elimination of the "Gas Tax" and elimination of Section 9 formula funds. In place of Section 9, it is proposed to combine highway and mass transit funds into a single block grant. A two-thirds cut in mass transit spending is recommended for FY 86/87. As a result of these cuts, BART for the first time is faced with the definite prospect of not receiving any formula funds in FY 86/87 beyond those programmed for the Daly City Turnback and Yard.

On the state level, the Transportation Planning and Development (TP&D) funds continue to decrease as a result of a reduction in gas usage and prices. In addition, substantial uncertainty must be attached to state guideway funding due to California's recent turn toward more emphasis on highway and a major transit project in Los Angeles. These developments make it less likely that BART will be able to obtain state funding for extensions.

State and Federal funding availability is based upon the estimates provided by MTC. MTC allocated bridge tolls are assumed to be available at the rate of \$3 million per year.

Available BART capital reserves are also identified along with estimated interest earnings with interest calculated on an annual basis. In each year, funded cash flows are drawn down from the starting balance of each reserve source. The interest earned on the resulting balance accrues to that account. Simple interest is calculated at an 8% annual rate. BART reserves contribute a significant amount to the Daly City Turnback. In addition, reserves contribute part of the local match for 90 New Transit Vehicles.

The BART Board approved a new Sales Tax Revenue Bond Issue in November 1985. The proceeds from the new bond issue refund the 1982 Sales Tax Bonds (the proceeds of which are to be used for a portion of the new transit vehicle purchase). The balance will be used to fund parking improvement projects and park/ride facilities. BART had anticipated Section 9 funds to also support the parking projects, but that appears unlikely due to federal budget cuts.

A final element in the capital financial picture is the linkage to the annual operating budget. This connection in the annual budget includes capital and other allocations for revenue bond debt service, improvement allowance, planning, and joint development.

CAPITAL FUNDING ADEQUACY

Given the funding assumptions discussed, a comparison with capital requirements is shown in Table III-8 on pages III-22 through III-24. The table shows the aggregate need and projected availability by source for each year in the current planning period.

Because of their magnitude and financial complexity, additional detail is provided in Tables III- , III- , and III- , beginning on page III- for the Daly City Turnback and Yard, the New Transit Vehicles, and the BART Extensions.

It will be necessary to receive assistance from each level of government in order to fund the extension program. Since federal funds are in short supply, a strong commitment for state and local funding is important to demonstrate local support to federal decision makers. As seen in Table III- , the BART Extensions are planned on the basis of fifty percent federal funding, twenty-five percent state funding, and twenty-five percent local funding.

The impact of this financial plan upon BART's capital reserves is shown in Table III- on page III- .

CONCLUSION

It is difficult to predict what will be the final outcome of Gramm-Rudman. Programming of BART capital projects has been based upon the assumption that grant programs at the federal, state, and local levels will continue at approximately their current levels. Given this assumption, BART's capital program appears fundable with two important exceptions: Funding for system extensions is highly uncertain even with continuation of a federal program in this category due to intense competition from other metropolitan areas. Second, BART must seek other funding sources for its parking improvement projects. Reduction of the current federal program will endanger not only potential extension funding, but BART's current Capacity Expansion Program and routine capital replacement process.

TABLE III-
BART FIVE-YEAR FUNDED CAPITAL PROGRAM (\$181000)

CASH FLGS									
FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	91/92	TOTAL
GROUP 1 - VEHICLE									
41BG	BRAKE GRID SHIELDS	220	0	0	0	0	0	0	220
41BH	MOTOR REMIND UPGRADE	6002	915	0	0	0	0	0	6917
41BJ	BRAKE RELAY LOGIC MOD-OVERLOAD	161	0	0	0	0	0	0	161
41BK	REPLACE PCB-FILLED CAPACITORS	0	1037	0	0	0	0	0	1037
41EL	TRANSIT VEHICLE FIREHARDENING	11633	0	0	0	0	0	0	20818
41GB	2ND GENERATION ATU/130 A-CARS	0	0	5244	4756	0	0	0	10000
41GG	NEW UBL POSITIVE PLATE BATTERIES	370	344	0	0	0	0	0	714
42AA	150 2ND GEN TRANS VEH W/ PHC ATC	18348	47365	174272	0	0	0	0	235982
42CA	NEW VEHICLE ATC - PREPRODUCTION	3829	5203	0	0	0	0	0	9032
42CA	SUBTOTAL	40363	50645	179516	4756	0	0	0	203004
GROUP 2 - FACILITIES - MAINLINE									
0-B-	EXTENSIONS ROADWAY ACQUISITION	12441	0	0	0	0	0	0	12441
01XG	PERM THPS/CALTRANS LOT-FMS (11)	2040	314	0	0	0	0	0	2354
02AB	FREMIT-50, BAY STUDY & AAZ/EIS	91	120	120	0	0	0	0	331
03FD	FIRE MAIN MODIFICATIONS (OHT)	283	56	0	0	0	0	0	339
04AB	EIR & PREL ENGRG/ P-LINE PH I	88	643	0	0	0	0	0	731
07CB	KE TRACK (KET)	21744	2212	0	0	0	0	0	23956
08AB	L-LINE EXTENSION PLANNING	136	317	0	0	0	0	0	453
10AJ	1-680 - BUS ON-RAMP PADS-SLRN	15	90	43	0	0	0	0	148
11--	DAILY CITY TURNBACK & YARD	45920	6004	18955	0	0	0	0	70875
11FH	STA VENTILATH FAN CONTROL MUDS	35	107	0	0	0	0	0	142
11JF	PLAZA ENTRANCE FENCING 16TH & 24TH	0	80	0	0	0	0	0	80
11TD	SHOP FACILITIES - 00Y	0	0	1582	0	0	0	0	1582
12AB	ALTERA. ANALYSIS & EIR-SFO	107	423	0	0	0	0	0	530
15AW	ADDITIONAL MILEPOST SIGNS	200	0	0	0	0	0	0	200
15AY	FAN CONTROL SAFETY ENCLOSURES	231	0	0	0	0	0	0	231
15BF	STATION POINT SIGN CONTROL	100	41	0	0	0	0	0	141
	SUBTOTAL	83431	10447	20700	0	0	0	0	114572
GROUP 3 - FACILITIES - STATION & ACCESS									
0--K	ACCESS FACILITIES	1560	0	0	0	0	0	0	1560
0--K	PARKING CAPACITY EXPANSION	0	1007	0	0	0	0	0	1007
01G-	FVS (ALA, P/R LCT) (100SP)	0	0	0	0	86	0	0	86
01M-	BFS SURF EXPLAN CONST (80SP)	0	20	0	0	0	0	0	20
01NK	HAS EMPLOYEE BREAK ROOM	0	63	0	0	0	0	0	63
01O-	HAS SURF EXPN R/W ACQ CORH(300SP)	0	2264	0	0	0	0	0	2264
01OE	SP SHS-N PKG EXP/PHI (173 SP)	0	0	0	0	0	353	0	353
01OF	SP PKG EXP/PHI (173SP)	0	3465	0	0	0	0	0	3465
01VG	UCS SURF EXP R/W ACQ CONH(500SP)	0	2310	0	0	0	0	0	2310
02GA	GRIMMER (MISSION STATION)	0	11130	0	0	0	0	0	11130
03CG	WET STANDPIPE WALNUT CK TUNNEL	32	106	0	0	0	0	0	138
03JE	LAS SURFACE EXPANSION CHS (0SP)	0	254	267	0	0	0	0	521
03LG	FRINGE PARKING FAC-WCS (1132SP)	0	0	0	750	0	0	0	750
03NH	PHS - JOINT DEV REPL PKG(1861SP)	0	0	3197	8103	8509	744	0	20580
03NE	WESTLOT EXPANSION-PHIS(11200SP)	0	1200	924	0	0	0	0	2124
03PJ	ADL ATC WORK SPACE & TC ROOMS-C	5	40	0	0	0	0	0	45
03S-	CHS SURFACE EXPLAN CONSTH(100SP)	0	0	106	0	0	0	0	106
04DA	BUS STAIN PARKSIDE LCT-NCSTAY	668	449	0	0	0	0	0	1117

TABLE III-4 (Continued)

BART FIVE-YEAR FUNDED CAPITAL PROGRAM (\$x1000)

CASH FLOWS

FMS NO.	PROJECT NAME	FY87 YES	86/87	87/88	88/89	89/90	90/91	W1	5	TOTAL
GROUP 1: FACILITIES, STATION & ACCESS										
04GA	200-SP RAILWAY RD PK/RD LOT-ANS	3279	0	0	0	0	0	0	0	3279
04IA	RAILROAD AVE PARK/RIDE FACILITY	0	215	0	0	0	0	0	0	315
04KA	SOHLRSVILLE RD. PARK/WIDE FACIL	0	703	0	0	0	0	0	0	703
04MA	200-SP HILLCREST AV P/R LOT-ANS	1692	0	0	0	0	0	0	0	1692
05GB	NORTH DEKLELEY SURFACE EXPANSION	0	544	0	0	0	0	0	0	544
05KB	CNS SURF EXP R/W ACQ CENS(300SP)	0	1904	0	0	0	0	0	0	1904
05MD	COMPLETE WEST END OF LOT (RIS)	0	0	0	0	0	0	100	0	100
05NJ	AD'L ATC WORK SPACE @ TC ROOMS-R	5	66	0	0	0	0	0	0	71
06KA	HERCULES P/R FACILITY	0	2100	0	0	0	0	0	0	2100
06GA	DUBLIN PK/RD	0	7605	1599	1740	0	0	0	0	11004
08KA	BUS TRANSFER/PARK/IDE LOT - WL(VX)	0	0	377	0	0	0	0	0	377
11E-	100-SPACE PARKING EXPLAN - CAS (1	0	0	18	0	0	0	0	0	18
11E-	OAKLAND WEST FACILITY(700SP)	0	4000	0	0	0	0	0	0	4000
11IG	REPLACE SECURITY DOORS-CC STA	5	42	0	0	0	0	0	0	47
11II	RESTROOM ACCESS MODS - CCS	6	60	0	0	0	0	0	0	66
15AK	EMPLOYEE BREAKROOMS AT STATIONS	16	80	0	0	0	0	0	0	96
15AZ	WET STANDPIPE & FD CONNS-21 STA	0	800	418	0	0	0	0	0	1218
15LC	ESCALATOR REHABILITATION	0	2242	2000	360	0	0	0	0	4602
15NG	SELF OPERATOR-ELEVATORS/INDICPD	264	1290	976	0	2440	0	0	0	2400
99#B	ESSENTIAL PARKING MODS	0	8525	5510	3225	0	0	0	0	19700
	SUBTOTAL	7532	52685	15402	14178	10949	830	735	0	102311
GROUP 2: FACILITIES SUPPORT										
01TC	EXPAND SVC PIT/ADD COVER-INT	6	166	0	0	0	0	0	0	172
05NF	EXPAND TRANSPORTATION BUILDING-R	2	0	0	0	0	0	0	0	2
17CG	PAVE PKG LOT/STRAUC ARCA-USA	55	0	0	0	0	0	0	0	55
79ID	OVERHAUL WHEEL TRUING MACHINE	128	0	0	0	0	0	0	0	128
79NC	RAIL TRANSPORT DUGGIES	0	165	0	0	0	0	0	0	165
79NE	TRACK GEOMETRIC ANALYSIS CAN	0	370	0	0	0	0	0	0	370
	SUBTOTAL	189	641	0	0	0	0	0	0	829
GROUP 3: TRAIN CONTROL										
20--	4-STATE TICS SYSTEM PETER MODS	2020	3920	160	0	0	0	0	0	6900
20AC	ELIMINATE STATION INTERFACES	1908	370	112	0	0	0	0	0	2400
20AD	E-LINE MAKES & BREAKS	61	150	0	0	0	0	0	0	211
20BF	TIMELOCKING MODS	170	205	0	0	0	0	0	0	435
20FD	OPTIMIZE SPEED PROFILES	231	256	0	0	0	0	0	0	489
20FE	PERMANENT D-POINTS	67	35	0	0	0	0	195	297	489
21EB	ACI SYSEM IMPROVEMENT	0	70	0	0	0	0	0	0	70
61--	INTEGRATED CONTROL SYSTEM - ICS	21790	4260	1809	0	0	0	0	0	31859
	SUBTOTAL	27127	13258	2081	0	0	0	195	0	42661
GROUP 4: ALC & COMMUNICATIONS										
27BA	COMMUNICATIONS CABLE NETWORK	9867	2223	0	0	0	0	0	0	12090
27EB	REPLACE FIELD COMPUTERS-DAS	0	49	0	0	0	0	0	0	49
27IC	FIRE PHONES (DHT)	10	227	0	0	0	0	15	252	252
27OB	RADCON	3186	549	0	0	0	0	0	0	3735
27JB	PLATFORM PA EXT ABOVE GRD STAS	230	17	0	0	0	0	0	0	247
27RB	PLATFORM CCTV - DOWNMAN STAS	0	115	0	0	0	0	0	0	115
44DB	REPLAC AFC EQUIP COMPONENTS	0	135	0	0	0	0	0	0	135

DART FIVE-YEAR FUNDED CAPITAL PROGRAM (\$x1000)

CASH FLOWS

FMS PROJECT NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	91/92	TOTAL
GROUP: AIR & COMMUNICATIONS									
45AC	EXPAND AEC DAS CAPABILITY	350	61	0	0	0	0	0	411
45AH	AC/BART/MUNI SUPER PASS	160	700	765	1025	0	0	0	2650
45BF	IBM TICKET TRANSPORT	419	419	418	418	0	0	0	1675
45CB	"IBM" RETROFIT - CUBIC AFC	70	35	22	0	0	0	0	157
45DA	REPAIR & REDESIGN TRK. ENCLDS	207	0	0	0	0	0	0	207
	SUBTOTAL	14499	4560	1206	1443	0	0	15	21723
GROUP: ELECTRIFICATION									
03CH	34.5 KV SUBTRANS. LINE WDS-CLN	0	0	0	0	0	0	70	70
03FK	2ND PWR TRANSFORMER/PORTL-BHT	169	90	0	0	0	0	0	259
09FE	RPLC PCB TRANSFORMER @ SF VENT	102	440	186	0	0	0	0	728
18EG	ELECTRICAL CAPACITY INCREASE	583	0	0	0	0	0	0	583
19EX	PGGE RATE EVAL/ALT SOURCES	65	0	0	0	0	0	0	65
20HB	ADD'L STATION ESSENTIAL POWER	0	3	0	0	0	0	0	3
	SUBTOTAL	919	533	186	0	0	0	70	1708
GROUP: PROCUREMENTS									
15CL	RAIL REPLACEMENT PROG 1/11 (82/4)	439	191	0	0	0	0	0	630
15CL	RAIL REPLACEMENT PROG 84/6 111/1V	0	399	363	0	0	0	0	762
6A--	REPLACE AGMT INFO SYS - M15	4460	0	0	0	0	0	0	348
6ABD	M15 COMPUTER UPGRADE-HRD W/CFST	625	160	0	0	0	0	0	4460
64DD	FMS UPGRADE & ENHANCEMENT	255	25	0	0	0	0	0	825
79--	REPL MAINT EQ (82/4)	400	0	0	0	0	0	0	280
79AC	NEW VANS FY 85/86	27	0	0	0	0	0	0	400
79AD	NEW PICKUPS FY 85/86	15	0	0	0	0	0	0	27
79B-	REPL OVERAGE SEDAN/MNT VEH (82/4)	833	0	0	0	0	0	0	15
79B-	REPL OVERAGE SEDAN/MNT VEH 84/86	0	609	0	0	0	0	0	833
791V	VACUUMS & SCRUBBERS FY 85/86	10	0	0	0	0	0	0	609
	SUBTOTAL	7104	1732	363	0	0	0	0	9199
GROUP: OTHER COSTS									
17BR	1785 BPS OFF. & SPACE MODS - LMA	20	148	0	0	0	0	0	168
17BS	1986 5TH FLOOR RECURBISHMENT	0	102	0	0	0	0	0	102
17FD	BLDG MODS STREET/ELECT/MECH-STB	50	79	0	0	0	0	0	129
59DD	RTA DEMO INFC SYSTEM	28	0	0	0	0	0	0	28
91FC	EMERGENCY VENTILATION-OAK NVE(KW	35	0	0	0	0	0	0	35
91FD	UNDGRD VENT STUDY-SYST-MD	35	0	0	0	0	0	0	35
9945	LAND AND LAND RIGHTS	0	121	0	0	0	0	0	121
9945	AGENCY AND UTILITY AGREEMENTS	123	109	100	100	100	1000	0	1523
9945	OTHER COSTS-KIND AGENTS,ETC	28	100	100	100	100	1442	0	1870
9945	OUTSTANDING CLAIMS	0	0	0	0	0	3996	0	3996
9945	PROJECT DEVELOPMENT	0	2000	2000	2000	2000	2000	0	10000
9945	PLANNING AND SA DVLP'T	1099	1405	1394	1431	1506	1587	0	8422
9945	INVENTORY BUILDUP	0	4670	1867	1000	2664	2370	0	12571
9945	STA. AREA DEV-INFRASTR IMPVTS	0	1000	1000	1000	1000	1000	0	5000
9946	IMPROVEMENT ALLOWANCE	3000	3100	3200	3300	3400	3500	0	19500
9947	C-CAR START-UP	0	2000	0	0	0	0	0	2000
9947	SFS JUSTIFIED PROJETS	0	0	10000	0	0	0	0	10000
9947	DAILY CITY TURNBACK R E D/RUN	8000	0	0	0	0	0	0	8000

TABLE III-4 (Continued)

PART FIVE-YEAR FUNDED CAPITAL PROGRAM (\$1000)

FMS PROJECT		CASH FLOWS						
NO.	NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	YE 5 TOTAL
9997	GROUP: CINDER COSTS		0	1300	0	0	0	0
	HOUSING CITY AGENCY AGMTS		14825	20961	8931	10770	16895	0
	SUBTOTAL	12418						13000
	GRAND TOTAL	193781	157720	240415	29308	21719	17725	661693

TABLE III-5

BART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$x1000)

FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	M1 5	TOTAL
GROUP: VEHICLE									
2ND GENERATION ATD/138 A-CARS									
41G8	PROGRAM YEAR AMOUNT	0	0	3800	0	0	0	0	3800
	UNFUNDED CASH FLOW	0	0	3800	0	0	0	0	3800
42AA	150 2ND GEN TRANS VEH W/ PRG ATC	35709	0	0	0	0	0	0	35709
	PROGRAM YEAR AMOUNT	0	35709	0	0	0	0	0	35709
	UNFUNDED CASH FLOW	0	3800	0	0	0	0	0	39509
	SUBTOTAL PROGRAM YEAR AMOUNT	35709	0	35709	3800	0	0	0	39509
	SUBTOTAL UNFUNDED CASH FLOW	0	0	35709	3800	0	0	0	39509
GROUP: FACILITIES - MAINLINE									
EXTENSION & ACQUISITION									
0-B-	PROGRAM YEAR AMOUNT	73743	0	0	0	0	0	0	73743
	UNFUNDED CASH FLOW	0	29240	44503	0	0	0	0	73743
02A3	PROGRAM YEAR AMOUNT	0	1469	0	0	0	0	0	1469
	UNFUNDED CASH FLOW	0	0	0	734	735	0	0	1469
04AB	EIR & PHIL ENGRC/ P-LINE PH I	0	1529	0	0	0	0	0	1529
	PROGRAM YEAR AMOUNT	0	112	750	667	0	0	0	1529
	UNFUNDED CASH FLOW	0	1147	0	0	0	0	0	1147
08AB	L-LINE EXTENSION PLANNING	0	574	573	0	0	0	0	1147
	PROGRAM YEAR AMOUNT	0	0	0	0	0	0	0	0
	UNFUNDED CASH FLOW	0	0	0	0	0	0	0	0
11--	DAILY CITY TURNBACK & YARD	39065	39856	0	0	0	0	0	78921
	PROGRAM YEAR AMOUNT	22071	44946	11904	0	0	0	0	78921
	UNFUNDED CASH FLOW	6328	0	1668	4660	0	0	0	6328
11TD	SHOP FACILITIES - ODY	0	1970	0	0	0	0	0	1970
	PROGRAM YEAR AMOUNT	0	773	1197	0	0	0	0	1970
	UNFUNDED CASH FLOW	0	0	0	0	0	0	0	0
12AB	ALTERN. ANALYSIS & EIR-SFO	0	0	0	0	0	0	0	0
	PROGRAM YEAR AMOUNT	0	0	0	0	0	0	0	0
	UNFUNDED CASH FLOW	0	0	0	0	0	0	0	0
99*0	AERIAL BARRIERS PHASE I & II	0	0	0	0	0	0	0	0
	PROGRAM YEAR AMOUNT	0	0	10738	0	0	0	0	10738
	UNFUNDED CASH FLOW	0	0	0	0	0	0	0	0
99*1	SYSTEM SAFETY UPGRADE PH III REM	0	5000	0	0	0	0	0	5000
	PROGRAM YEAR AMOUNT	0	0	5000	0	0	0	0	5000
	UNFUNDED CASH FLOW	119136	50971	0	10738	0	0	0	180845
	SUBTOTAL PROGRAM YEAR AMOUNT	22071	75645	60595	10327	734	735	10738	180845
	SUBTOTAL UNFUNDED CASH FLOW	0	0	60595	10327	734	735	10738	180845
GROUP: FACILITY-STATION & ACCESS									
PRKNG PRDGM IMPR (1 742SP)									
0-K	PROGRAM YEAR AMOUNT	0	4028	0	0	0	0	0	4028
	UNFUNDED CASH FLOW	0	831	2490	707	0	0	0	4028
01EE	PKG FACILITY-LMS(III) (435 SP) 1	0	0	6485	0	0	0	0	6485
	PROGRAM YEAR AMOUNT	0	0	0	0	0	0	0	0
	UNFUNDED CASH FLOW	0	0	0	1276	3230	0	0	4506
01G-	FVS (TALA, PZR LCT) (100SP)	0	0	343	0	0	0	0	343
	PROGRAM YEAR AMOUNT	0	0	0	0	0	0	0	0
	UNFUNDED CASH FLOW	0	0	0	0	343	0	0	343

1 The Unfunded Cash Flow does not include \$1979 (\$ x 1000) to be expended beyond the five-year period.

TABLE III-5 (continued)

PART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$x1000)

FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	W1	5	TOTAL
SERVIC: FACILITIES/INSTRUMENT ACCESS---										
01GH	FRUITVALE FACILITY (550SP)		0	0	12039	0	0	0	0	12039
	PROGRAM YEAR AMOUNT		0	0	0	2130	5348	0	0	12039
01H-	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	BFS SURF EXPAN CONST (80SP)		0	78	0	0	0	0	0	78
01MH	UNFUNDED CASH FLOW		0	78	0	0	0	0	0	78
	PROGRAM YEAR AMOUNT		0	0	10809	0	0	0	0	10809
	UNFUNDED CASH FLOW		0	0	0	0	5996	0	0	5996
01O-	UNFUNDED CASH FLOW		0	0	0	4813	0	0	0	4813
	HAS SURF EXPN R/W ACQ CONH (300SP)		0	270	0	0	0	0	0	270
	PROGRAM YEAR AMOUNT		0	0	0	174	196	0	0	370
01OF	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	SP PKG EXP/PH II-SHS(XR)(836SP)		0	844	0	0	0	0	0	844
	PROGRAM YEAR AMOUNT		0	0	0	405	439	0	0	844
01VG	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	UCS SURF EXP R/W ACQ CONH (500SP)		0	0	1763	0	0	0	0	1763
	PROGRAM YEAR AMOUNT		0	0	0	860	903	0	0	1763
02GA	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	GRIMMER EMISSION STATION		0	336	0	0	0	0	0	336
	PROGRAM YEAR AMOUNT		0	0	165	174	0	0	0	339
03HG	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	ORINIDA FACILITY (500SP) 2		0	9023	0	0	0	0	0	9023
	PROGRAM YEAR AMOUNT		0	0	0	0	2808	0	0	2808
03JG	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	FRINCE PKG FACILITY-LAS (700SP)		0	0	10654	0	0	0	0	10654
	PROGRAM YEAR AMOUNT		0	0	0	4746	5445	0	0	10654
03LG	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	FRINCE PARKING FAC-WCS (1112SP)		0	15535	0	0	0	0	0	15535
	PROGRAM YEAR AMOUNT		0	0	0	4459	8217	0	0	15535
03NE	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	WESTLOT EXPANSION-PHS(1)(11200SP)		0	10738	0	0	0	0	0	10738
	PROGRAM YEAR AMOUNT		0	0	0	4607	4838	0	0	10738
03S-	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	CDS SURFACE EXPAN CONST (300SP)		0	0	422	0	0	0	0	422
	PROGRAM YEAR AMOUNT		0	0	148	274	0	0	0	422
03SH	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	CONCORD FACILITY (1700SP) 3		0	17779	0	0	0	0	0	17779
	PROGRAM YEAR AMOUNT		0	0	0	1100	6904	0	0	13253
041A	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	FRINCE PKG FACILITY		0	324	0	0	0	0	0	324
	PROGRAM YEAR AMOUNT		0	0	0	158	176	0	0	334
04KA	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	SOMERSVILLE RD. PARK/RIIDE FACILI		0	2812	0	0	0	0	0	2812
	PROGRAM YEAR AMOUNT		0	1616	504	612	0	0	0	2812
05K-	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	CNS SURF EXP R/W ACQ CCN (300SP)		0	217	0	0	0	0	0	217
	PROGRAM YEAR AMOUNT		0	0	217	0	0	0	0	217
05KH	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0
	EL CERRITO DEL NORTE FAC (500SP)		0	5970	0	0	0	0	0	5970
	PROGRAM YEAR AMOUNT		0	0	331	2315	2431	893	0	5970
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0

2 The Unfunded Cash Flow does not include \$1599 (\$ x 1000) be expended beyond the five-year period.
 3 The Unfunded Cash Flow does not include \$2520 (\$ x 1000) be expended beyond the five-year period.

BART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$x1000)

FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	91/92	TOTAL
GROUP 1: FACILITIES/STATION ACCESS									
06--	X-DUS FRY STOP PAIDS	0	148	0	0	0	0	0	148
	PROGRAM YEAR AMOUNT	0	0	0	0	0	0	0	148
06KA	UNFUNDED CASH FLOW	0	0	0	0	0	0	0	148
	HERCULES P/R FACILITY	0	0	0	0	0	0	0	148
07GN	PROGRAM YEAR AMOUNT	0	0	0	1370	0	0	0	1370
	UNFUNDED CASH FLOW	0	0	0	0	669	701	0	1370
	MACARTHUR FACILITY (500SP) 4	0	0	0	0	0	0	0	1370
08KA	PROGRAM YEAR AMOUNT	0	0	12140	0	0	0	0	12140
	UNFUNDED CASH FLOW	0	0	0	0	972	5974	0	6946
	WUS TRANSFER/PIKRIE LOT - MLVIX	0	0	0	0	0	0	0	6946
11E-	PROGRAM YEAR AMOUNT	0	130	0	0	0	0	0	130
	UNFUNDED CASH FLOW	0	0	130	0	0	0	0	130
11E-	100-SPACE PARKING EXPAN - DMS (1 5	0	0	0	0	0	0	0	71
	UNFUNDED CASH FLOW	0	0	71	0	0	0	0	71
11E-	OAKLAND WEST FACILITY (700SP)	0	0	0	0	0	0	0	8181
	PROGRAM YEAR AMOUNT	0	8181	0	0	0	0	0	8181
11FG	UNFUNDED CASH FLOW	0	1250	0	0	2674	2808	0	6732
	2 END STAIRWAYS-PLATF/MEZ -EMS	0	0	0	0	0	0	0	387
15LC	PROGRAM YEAR AMOUNT	0	387	0	0	0	0	0	387
	UNFUNDED CASH FLOW	0	105	282	0	0	0	0	387
15N-	ESCALATOR RENOVATION	0	1400	0	0	0	0	0	1400
	UNFUNDED CASH FLOW	0	0	1400	0	0	0	0	1400
15NE	PH IV SYSTEM ACCESSIBILITY IMPS	0	0	0	0	0	0	0	420
	UNFUNDED CASH FLOW	0	0	420	0	0	0	0	420
15NE	PROGRAM YEAR AMOUNT	0	0	0	0	0	0	0	1300
	UNFUNDED CASH FLOW	1300	776	0	0	0	0	0	1300
	WILSON STATION RENOVATION	524	5191	82748	1370	0	0	0	137009
	UNFUNDED CASH FLOW	524	4656	6783	27376	49346	35009	568	124262
GROUP 2: FACILITIES/SUPPORT									
01RM	EXPAND TRANSPORTATION BUILDING-F	0	265	0	0	0	0	0	265
	PROGRAM YEAR AMOUNT	0	0	265	0	0	0	0	265
03PH	UNFUNDED CASH FLOW	0	0	0	0	0	0	0	258
	EXPAND TRANSPORTATION BUILDING-C	0	258	0	0	0	0	0	258
05NF	PROGRAM YEAR AMOUNT	0	0	258	0	0	0	0	316
	UNFUNDED CASH FLOW	0	0	0	0	0	0	0	316
	EXPAND TRANSPORTATION BUILDING-R	0	316	0	0	0	0	0	839
	PROGRAM YEAR AMOUNT	0	0	316	0	0	0	0	839
	UNFUNDED CASH FLOW	0	439	0	0	0	0	0	839
	SUBTOTAL PROGRAM YEAR AMOUNT	0	0	839	0	0	0	0	839
	SUBTOTAL UNFUNDED CASH FLOW	0	0	0	0	0	0	0	8261
GROUP 3: TRAIN CENTER									
20--	WAYSIDE C & D SYSTEM REFOR. NIMS	0	8261	0	0	0	0	0	8261
	PROGRAM YEAR AMOUNT	0	0	4730	3291	232	0	0	8261
	UNFUNDED CASH FLOW	0	0	0	0	0	0	0	8261

4 The Unfunded Cash Flow does not include \$5194 (\$ x 1000) to be expended beyond the five-year period.

5 The Unfunded Cash Flow does not include \$1449 (\$ x 1000) to be expended beyond the five-year period.

TABLE III-5 (continued)

DART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$X1000)

FMS PROJECT NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	91/92	TOTAL
GROUP: FACILITY STATION ACCESS									
01GH	FRUITVALE FACILITY (500SP)								
	PROGRAM YEAR AMOUNT	0	0	12030	0	5346	5361	0	12039
01M-	UNFUNDED CASH FLOW	0	0	0	2130	0	0	0	12039
01M-	SP SURF EXP R/W ACQ CON (40SP)								
	PROGRAM YEAR AMOUNT	0	78	0	0	0	0	0	78
01M-	UNFUNDED CASH FLOW	0	78	0	0	0	0	0	78
01MH	DAY FAIR FACILITY (500SP)								
	PROGRAM YEAR AMOUNT	0	0	10809	0	0	0	0	10809
	UNFUNDED CASH FLOW	0	0	0	4813	5996	0	0	10809
01Q-	HAS SURF EXPN R/W ACQ CON (300SP)								
	PROGRAM YEAR AMOUNT	0	370	0	0	0	0	0	370
01Q-	UNFUNDED CASH FLOW	0	0	0	174	196	0	0	370
01Q-	SP PKG EXP/PH II-SHS(XR)(436SP)								
	PROGRAM YEAR AMOUNT	0	844	0	0	0	0	0	844
	UNFUNDED CASH FLOW	0	0	0	405	439	0	0	844
01VG	UCS SURF EXP R/W ACQ CON (500SP)								
	PROGRAM YEAR AMOUNT	0	0	1763	0	0	0	0	1763
02GA	UNFUNDED CASH FLOW	0	0	0	860	903	0	0	1763
02GA	GRIMMER TRAIL STATION								
	PROGRAM YEAR AMOUNT	0	335	0	0	0	0	0	339
	UNFUNDED CASH FLOW	0	0	165	174	0	0	0	339
03HG	ORIHDA FACILITY (500SP) 2								
	PROGRAM YEAR AMOUNT	0	0	9023	0	0	0	0	9023
	UNFUNDED CASH FLOW	0	0	0	0	2880	4544	0	7424
03JG	FRINGE PKG FACILITY-LAS (700SP)								
	PROGRAM YEAR AMOUNT	0	0	10654	0	0	0	0	10654
03LG	UNFUNDED CASH FLOW	0	0	0	4746	5445	463	0	10654
03LG	FRINGE PARKING FAC-WCS (1132SP)								
	PROGRAM YEAR AMOUNT	0	1535	0	0	0	0	0	1535
	UNFUNDED CASH FLOW	0	0	0	4659	8217	2859	0	1535
03NE	WESTLOT EXPANSION-IMP (111200SP)								
	PROGRAM YEAR AMOUNT	0	10736	0	0	0	0	0	10736
	UNFUNDED CASH FLOW	0	0	0	4607	4836	408	0	10736
03S-	COS SURFACE EXPAN CON (300SP)								
	PROGRAM YEAR AMOUNT	0	0	422	0	0	0	0	422
	UNFUNDED CASH FLOW	0	0	146	274	0	0	0	422
03SH	CONCRETE FACILITY (1700SP) 3								
	PROGRAM YEAR AMOUNT	0	0	17779	0	6904	7249	0	17779
	UNFUNDED CASH FLOW	0	0	0	1100	0	0	0	17779
041A	RAILROAD AVE PARK/HIDE FACILITY								
	PROGRAM YEAR AMOUNT	0	324	0	0	0	0	0	324
	UNFUNDED CASH FLOW	0	0	0	158	0	176	0	324
04KA	SOMERSVILLE RD. PARK/HIDE FACIL								
	PROGRAM YEAR AMOUNT	0	2812	504	0	0	0	0	2812
	UNFUNDED CASH FLOW	0	1616	0	612	0	0	0	2812
05K-	CNS SURF EXP R/W ACQ CON (300SP)								
	PROGRAM YEAR AMOUNT	0	217	0	0	0	0	0	217
	UNFUNDED CASH FLOW	0	0	217	0	0	0	0	217
05KH	EL CERRILLO DEL NORTE FAC (500SP)								
	PROGRAM YEAR AMOUNT	0	5970	0	0	0	0	0	5970
	UNFUNDED CASH FLOW	0	0	331	2315	2431	693	0	5970

2 The Unfunded Cash Flow does not include \$1599 (\$ x 1000) to be expended beyond the five-year period.

3 The Unfunded Cash Flow does not include \$5996 (\$ x 1000) to be expended beyond the five-year period.

TABLE III-5 (Continued)

III-17

PART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$x1000)

PROJECT FMS NO.	NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	W1 5	TOTAL
GROUP: FACILITIES-STATION & ACCESS									
06--	X-BUS TRAY STOP PADS	0	148	0	0	0	0	0	148
06KA	UNFUNDED CASH FLOW	0	0	0	0	0	0	148	148
	HERCULES P/H FACILITY	0	0	0	1370	0	0	0	1370
07GH	UNFUNDED CASH FLOW	0	0	0	669	701	0	0	1370
	MACARTHUR FACILITY (500SP) ⁴	0	0	12140	0	0	0	0	12140
08KA	UNFUNDED CASH FLOW	0	0	0	0	972	5974	0	6946
	BUS TRANSFER/PKRRIDE LOT - MLV(X)	0	130	0	0	0	0	0	130
11E--	UNFUNDED CASH FLOW	0	130	0	0	0	0	0	130
	100-SPACE PARKING (XAN - QWS (1 5	0	0	71	0	0	0	0	71
11E--	UNFUNDED CASH FLOW	0	0	71	0	0	0	0	71
	PAKLAND WEST FACILITY (700SP)	0	8181	0	0	0	0	0	8181
11FG	UNFUNDED CASH FLOW	0	1250	0	0	2674	2808	0	6132
	2- END STAIRWAYS-PLAT/NEZ - EMS	0	387	0	0	0	0	0	387
15LC	UNFUNDED CASH FLOW	0	105	282	0	0	0	0	387
	ESCALATOR REHABILITATION	0	1480	0	0	0	0	0	1480
15N--	UNFUNDED CASH FLOW	0	0	1480	0	0	0	0	1480
	PH IV SYSTEM ACCESSIBILITY IMPS	0	0	420	0	0	0	0	420
15NE	UNFUNDED CASH FLOW	0	0	420	0	0	0	420	420
	HANDICAPPED MOODS-EDGE	1300	0	0	0	0	0	0	1300
	UNFUNDED CASH FLOW	524	776	0	0	0	0	0	1300
	SUBTOTAL PROGRAM YEAR AMOUNT	1300	51591	25748	1370	0	0	0	137009
	SUBTOTAL UNFUNDED CASH FLOW	524	4656	6783	27376	49346	35009	568	124262
GROUP: FACILITIES-SUPPORT									
01RM	EXPAND TRANSPORTATION BUILDING-F	0	265	0	0	0	0	0	265
	UNFUNDED CASH FLOW	0	0	265	0	0	0	0	265
03PH	EXPAND TRANSPORTATION BUILDING-C	0	258	0	0	0	0	0	258
	UNFUNDED CASH FLOW	0	0	258	0	0	0	0	258
05NF	EXPAND TRANSPORTATION BUILDING-H	0	316	0	0	0	0	0	316
	UNFUNDED CASH FLOW	0	0	316	0	0	0	0	316
	SUBTOTAL PROGRAM YEAR AMOUNT	0	439	0	0	0	0	0	839
	SUBTOTAL UNFUNDED CASH FLOW	0	0	839	0	0	0	0	839
GROUP: TRAIN-SERIES									
20--	WAYSIDE TC & SYSTEM REFOR MUOS	0	8261	0	0	0	0	0	8261
	UNFUNDED CASH FLOW	0	0	4730	3291	232	0	0	8261

4 The Unfunded Cash Flow does not include \$5194 (\$ x 1000) to be expended beyond the five-year period.

5 The Unfunded Cash Flow does not include \$1449 (\$ x 1000) to be expended beyond the five-year period.

TABLE III-5 (Continued)

FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	W15	TOTAL
GROUP: BRAIN CONTROL									
21EB	ACT SYSTEM IMPROVEMENT								
	PROGRAM YEAR AMOUNT	0	249	0	0	0	0	0	249
	UNFUNDED CASH FLOW		249	0	0	0	0	0	249
	SUBTOTAL PROGRAM YEAR AMOUNT	0	4910	0	0	0	0	0	4910
	SUBTOTAL UNFUNDED CASH FLOW	0	249	4738	3291	232	0	0	4510
GROUP: AFS & COMMUNICATIONS									
45AH	AC/BART/MUNI SUPER PASS								
	PROGRAM YEAR AMOUNT	0	0	286	0	0	0	0	286
	UNFUNDED CASH FLOW	0	0	286	286	0	0	0	572
	SUBTOTAL PROGRAM YEAR AMOUNT	0	0	286	286	0	0	0	572
	SUBTOTAL UNFUNDED CASH FLOW	0	0	0	286	0	0	0	286
GROUP: ELECTRIFICATION									
15EG	ELECTRICAL CAPACITY INCREASE								
	PROGRAM YEAR AMOUNT	0	7207	0	0	0	0	0	7207
	UNFUNDED CASH FLOW	0	3330	2350	1187	0	0	340	7207
20BH	ADD'L STATION ESSENTIAL POWER								
	PROGRAM YEAR AMOUNT	0	2031	0	0	0	0	0	2031
	UNFUNDED CASH FLOW	0	297	1734	0	0	0	0	2031
	SUBTOTAL PROGRAM YEAR AMOUNT	0	9238	0	0	0	0	0	9238
	SUBTOTAL UNFUNDED CASH FLOW	0	3627	4084	1187	0	0	340	9238
GROUP: ENGAGEMENTS									
15CL	MAIL REPL PH V 186/77								
	PROGRAM YEAR AMOUNT	0	91	0	0	0	0	0	91
	UNFUNDED CASH FLOW	0	91	0	0	0	0	0	91
15CM	2ND BALL REPL PRDGL(1) 87/88								
	PROGRAM YEAR AMOUNT	0	281	0	0	0	0	0	281
	UNFUNDED CASH FLOW	0	0	281	0	0	0	0	281
79--	REPL MAINT CO 84/6								
	PROGRAM YEAR AMOUNT	400	0	0	0	0	0	0	400
	UNFUNDED CASH FLOW	200	200	0	0	0	0	0	400
79--	REPL MAINT CO 86/8								
	PROGRAM YEAR AMOUNT	0	400	0	0	0	0	0	400
	UNFUNDED CASH FLOW	0	200	200	0	0	0	0	400
79--	REPL MAINT EU 88/90								
	PROGRAM YEAR AMOUNT	0	400	0	0	0	0	0	400
	UNFUNDED CASH FLOW	0	0	200	0	200	0	0	400
79AC	NEW VANS FY 87/88								
	PROGRAM YEAR AMOUNT	0	32	0	0	0	0	0	32
	UNFUNDED CASH FLOW	0	0	32	0	0	0	0	32
79AD	NEW VANS FY 88/89								
	PROGRAM YEAR AMOUNT	0	11	0	0	0	0	0	11
	UNFUNDED CASH FLOW	0	11	0	0	0	0	0	11
79B-	REPL OVIRAGE SEDAN/MNT VEH 184/6								
	PROGRAM YEAR AMOUNT	0	2637	0	0	0	0	0	2637
	UNFUNDED CASH FLOW	0	0	2637	0	0	0	0	2637

BART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$X1000)

FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	W15	TOTAL
GROUP 1: PROCUREMENTS									
798-	REPL OVERAGE SEDAN/MNT VEH 86/88								
	PROGRAM YEAR AMOUNT	0	1056	0	0	0	0	0	1056
	UNFUNDED CASH FLOW	0	0	1056	0	0	0	0	1056
799-	REPL OVERAGE SEDAN/MNT VEH 88/79								
	PROGRAM YEAR AMOUNT	0	0	370	0	0	0	0	370
	UNFUNDED CASH FLOW	0	0	0	370	0	0	0	370
790A	NEW HI-RAILERS - GEN FY 86/87								
	PROGRAM YEAR AMOUNT	0	232	0	0	0	0	0	232
	UNFUNDED CASH FLOW	0	232	0	0	0	0	0	232
790A	NEW HI-RAILERS - GEN FY 87/88								
	PROGRAM YEAR AMOUNT	0	75	0	0	0	0	0	75
	UNFUNDED CASH FLOW	0	0	75	0	0	0	0	75
	SUBTOTAL PROGRAM YEAR AMOUNT	400	5255	370	0	0	0	0	6025
	SUBTOTAL UNFUNDED CASH FLOW	200	734	4521	370	200	0	0	6025
GROUP 2: OTHER COSTS									
994B	REGIONAL EMERG TRAINING PROG								
	PROGRAM YEAR AMOUNT	1250	0	0	0	0	0	0	1250
	UNFUNDED CASH FLOW	833	417	0	0	0	0	0	1250
	SUBTOTAL PROGRAM YEAR AMOUNT	1250	0	0	0	0	0	0	1250
	SUBTOTAL UNFUNDED CASH FLOW	833	417	0	0	0	0	0	1250
	GRAND TOTAL PROGRAM YEAR AMOUNT	157795	126404	87204	12102	0	0	0	383511
	GRAND TOTAL UNFUNDED CASH FLOW	23628	85328	117269	46637	50512	35744	11646	370764

TABLE III-6

BART FIVE-YEAR FUNDING CASH FLOW BY SOURCE (\$X1000)

FUND SOURCE	PRIOR YRS	86/87	FISCAL YEAR			87/90	89/91	90/91	91/92	TOTAL
FEDERAL FUNDS										
UNTA SEC 3 (R0X)	76336	44480	5926	0	0	0	0	0	168	126810
UNTA SEC 3 (R0X) - AGNLY (UNTA03)	10969	9473	42927	0	0	0	0	0	0	62969
UNTA SEC 3 (R0X) - AGNLY (UNTA03)	20900	3330	5447	4405	0	0	0	0	0	24082
UNTA SEC 9 (BLOCK GRANT (UNTA09))	493	0	0	0	0	0	0	0	0	493
UNTA SEC 5 (R0X) - PLAN (R0X) (UNTA05)	106658	57283	53900	4405	0	0	0	0	168	224354
STATE FUNDS										
TP60/SU-620 GUIDEWAY (GOWYT)	14533	10151	16476	0	0	0	0	0	0	41160
ART. XIX/PROPS GUIDEWAY (GOWYA)	11612	9295	731	0	0	0	0	0	0	21638
ART. XIX INTERMUNAL (P511)	70	74	0	0	0	0	0	0	0	144
SUBTOTAL	26215	19520	17207	0	0	0	0	0	0	62942
REGIONAL FUNDS										
FOR	4299	1794	578	773	0	0	0	0	2	7446
BRIDGE TULLS (TOLLU)	5087	3913	5849	1101	0	0	0	0	0	15820
STA	1995	1027	2241	252	0	0	0	0	0	5625
SUBTOTAL	11261	6634	6668	2126	0	0	0	0	2	28691
BART FUNDS										
GENERAL CONSTRUCTION (OPGRG)	8456	7063	11047	2123	3787	6326	6326	6326	100	39502
BASIC SYSTEM COMPLETION (OPGRB)	78	2229	2064	2000	2000	2000	2000	2000	0	10371
SYS. IMPROVEMENT RESERVE (OPERS)	6199	1226	142	0	0	0	0	0	40	7607
DLY CITY CNST. FUND ALL. (OPERA)	0	2000	2053	0	0	0	0	0	0	4053
VEN. FIRE HARDENING FNO. (OPERE)	812	2317	0	0	0	0	0	0	0	3129
INTEREST TRANS. FUND (OPERT)	6665	160	4098	0	0	0	0	0	0	12923
ROW ACQUIS. AND EXT. FLN. (ROW/LC)	16544	1633	163	0	0	0	0	0	0	18340
IMPROVEMENT ALLOWANCE (OPERT)	4269	6916	5615	4078	3400	3500	3500	3500	70	27852
OPERATING & UNKNOW'N FUNDS (OPERO)	237	892	0	0	0	0	0	0	635	1764
MULTI YR CAPITAL ALLGNS (OPERN)	2325	3109	1464	1431	1506	1587	1587	1587	0	11422
REV. BOND CONST. FUND (OPERC)	47607	46748	13490	13145	11026	4312	4312	4312	0	209343
SUBTOTAL	47607	74293	160740	22777	21719	17725	17725	17725	845	345706
GRAND TOTAL	193781	157730	240415	29308	21719	17725	17725	17725	1015	661693

BART FIVE-YEAR UNFUNDED CASH FLOW BY SOURCE (\$X1000)

FUND SOURCE	PRIOR YRS	FISCAL YEAR					MI 5	TOTAL
		86/87	87/88	88/89	89/90	90/91		
FEDERAL FUNDS--								
UNTA SEC J 75% MONEY (UNTAJ)	5117	51344	70140	3291	232	0	8053	138377
UNTA SEC 9 BUCK GRANT (UNTA9)	17533	26330	25812	32364	37420	29131	605	172195
UNTA SEC 5.619 PLAN. (RES. (UNTAH)	833	417	0	0	0	0	0	1259
FEDERAL AID INTERSTATE (FALI)	0	0	885	4607	4838	408	0	10738
SUBTOTAL	23483	78091	100037	40262	42490	29539	8658	322560
STATE FUNDS--								
PROV/SUB-GRS GUIDEWAY (GDJYT)	0	0	2791	0	0	0	0	2791
OTHER STATE (OTHER)	0	0	130	0	0	0	0	130
ART. XIX/PROP-5 GUIDEWAY (GDWYA)	0	527	372	188	0	0	54	1141
SUBTOTAL	0	527	3293	188	0	0	54	4062
REGIONAL FUNDS--								
TDA	0	0	0	286	0	0	0	286
BRIDGE TOLLS (TOLLB)	145	6365	13748	5794	7933	6116	2782	42883
SUBTOTAL	145	6365	13748	6080	7933	6116	2782	43169
BART FUNDS-----								
IMPROVEMENT ALLOWANCE (OPERI)	0	232	0	0	0	0	0	232
OPERATING & UNKNOWN FUNDS (OPERO)	0	113	151	107	89	89	152	741
SUBTOTAL	0	345	151	107	89	89	152	573
GRAND TOTAL	23628	85328	117265	46637	50512	35744	11646	370764

TABLE III-8

CAPITAL PROGRAM COMMITMENTS BASIS
FUNDING REQUIREMENTS VS. PROJECTED FUNDING

FUND SOURCE	PH01R	86/87	87/88	88/89	89/90	90/91
-----MONEY (UMTA3)-----						
UMTA SEC 3.80% MONEY (UMTA3)						
PROJECTED	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0
UMTA SEC 3.75% MONEY (UMTA3)						
PROJECTED	30000	36213	30000	4053	0	0
REQUIRED	94111	36213	0	4053	0	0
DIFFERENCE	-64111	0	30000	0	0	0
UMTA STOCK GRANT (UMTA3)						
PROJECTED	30000	15000	20000	20000	20000	20000
REQUIRED	41636	65623	70653	1370	0	0
DIFFERENCE	-11636	-54623	-50653	18630	20000	20000
UMTA SEC 5+6+9 PLAN+GRES+(UMTA3)						
PROJECTED	0	0	0	0	0	0
REQUIRED	1250	0	0	0	0	0
DIFFERENCE	-1250	0	0	0	0	0
FEDERAL AID URGAN (FAU)						
PROJECTED	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0
FEDERAL AID INTERSTATE (FAI)						
PROJECTED	0	10738	0	0	0	0
REQUIRED	0	10738	0	0	0	0
DIFFERENCE	0	0	0	0	0	0
SUBTOTAL FEDERAL FUNDS						
PROJECTED	60000	61951	50000	24053	20000	20000
REQUIRED	136997	116574	70653	9423	0	0
DIFFERENCE	-76997	-54623	-20653	18630	20000	20000
-----TP60/50-620 GUIDEWAY (GCMY1)-----						
PROJECTED	0	0	0	0	0	0
REQUIRED	2791	0	0	0	0	0
DIFFERENCE	-2791	0	0	0	0	0
OTHER STATE (OTHER)						
PROJECTED	0	0	0	0	0	0
REQUIRED	0	130	0	0	0	0
DIFFERENCE	0	-130	0	0	0	0
ART. XIX/ARPS GUIDEWAY (GCMY1)						
PROJECTED	0	1141	0	0	0	0
REQUIRED	0	1141	0	0	0	0
DIFFERENCE	0	-1141	0	0	0	0
ART. XIX INTERMODAL (PS1)						
PROJECTED	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0
SB-1750						
PROJECTED	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0

TABLE III-8 (continued)
CAPITAL PROGRAM COMMITMENTS BASIS
FUNDING REQUIREMENTS VS. PROJECTED FUNDING

FUND SOURCE	PHOR	86/87	87/88	88/89	89/90	90/91	WIS	TOTAL
SUBTOTAL STATE FUNDS								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	2791	1271	0	0	0	0	0	4062
DIFFERENCE	-2791	-1271	0	0	0	0	0	-4062
IDA								
PROJECTED	0	1000	1000	1000	1000	1000	0	5000
REQUIRED	0	0	286	0	0	0	0	286
DIFFERENCE	0	1000	714	1000	1000	1000	0	4714
BRIDGE TOLLS (TOLLB)								
PROJECTED	2772	3000	3000	3000	3000	3000	0	17772
REQUIRED	18007	7586	14865	2685	0	0	0	45143
DIFFERENCE	-15235	-4586	-13865	315	3000	3000	0	-27371
STA								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
SUBTOTAL REGIONAL FUNDS								
PROJECTED	2772	4000	4000	4000	4000	4000	0	22772
REQUIRED	18007	7586	17151	2685	0	0	0	45143
DIFFERENCE	-15235	-3586	-13151	1315	4000	4000	0	-22371
DALY CITY TRK C*RUN RES (UPERD)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
GENERAL CONSTRUCTION (CPENG)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
BASIC SYSTEM COMPLETION (UPERD)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
SYS. IMPROVEMENT RESERVE (OPERS)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
DLY CITY CONST. FUND ALL* (OPERA)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
VEH. FIRE HAZARDING FND* (UPEFF)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0

TABLE III-8 (continued)

CAPITAL PROGRAM COMMITMENTS BASIS
FUNDING REQUIREMENTS VS. PROJECTED FUNDING

FUND SOURCE	PRIOR	86/87	87/88	88/89	89/90	90/91	91/92	TOTAL
INTEREST TRANSFER FUND (CPERT)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
REV. BOND AND EXT. PLN. (ROW/LE)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
IMPROVEMENT ALLOWANCE (OPER1)								
PROJECTED	3000	3100	3200	3300	3400	3500	0	19500
REQUIRED	0	232	0	0	0	0	0	232
DIFFERENCE	3000	2868	3200	3300	3400	3500	0	19268
OPERATING & UNKNOWN FUNDS (OPER0)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	741	0	0	0	0	0	741
DIFFERENCE	0	-741	0	0	0	0	0	-741
MULTI YR CAPITAL ALLOCNS (UPHEN)								
PROJECTED	1099	1405	1394	1431	1506	1587	0	8422
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	1099	1405	1394	1431	1506	1587	0	8422
REV. BOND CONST. FUND (OPER1)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
SUBTOTAL BART FUNDS								
PROJECTED	4099	4505	4594	4731	4906	5087	0	27922
REQUIRED	0	973	0	0	0	0	0	973
DIFFERENCE	4099	3532	4594	4731	4906	5087	0	26949
GRAND TOTAL								
PROJECTED	66871	70456	58594	56784	28906	29087	0	200698
REQUIRED	157795	126404	87204	12300	0	0	0	383511
DIFFERENCE	-90924	-55948	-28610	24676	28906	29087	0	-92813

Table III-9

DALY CITY TURNBACK/YARD FUNDING			
(\$000)			
<u>SOURCE</u>	<u>FUNDED</u>	<u>UNFUNDED</u>	<u>TOTAL</u>
UMTA 3 80%	7,900	-0-	7,900
UMTA 3 75%	10,969	33,069	44,038
UMTA 9 80%	14,341	45,852	60,193
STATE ABD RAIL R.O.W.	500	-0-	500
STATE ART XIX	10,100	-0-	10,100
STA	3,174	-0-	3,174
BRIDGE TOLL	4,193	-0-	4,193
BART/MTC*	<u>19,702</u>	<u>-0-</u>	<u>19,702</u>
TOTAL	70,879	78,921	149,800

* Funding to be provided by BART per Full Funding Grant Agreement if not available from MTC sources.

Table III-10

TRANSIT VEHICLE FUNDING 150-C-CARS (Excluding Preproduction ATC) (\$000)			
<u>SOURCE</u>	<u>FUNDED</u>	<u>UNFUNDED</u>	<u>TOTAL</u>
UMTA 3 80%	47,079	-0-	47,079
UMTA 75%	52,000	30,000	82,000
STATE TP&D	28,527	2,791	31,318
BRIDGE TOLLS	1,431	2,918	4,349
BART BOND/RESERVES	<u>110,948</u>	<u>-0-</u>	<u>110,948</u>
TOTAL	239,985	35,709	275,694

Table III-11

EXTENSION PROJECTS BY PROPOSED FUNDING SOURCE				
(\$000)				
<u>PROJECT</u>	<u>FUNDING SOURCE</u>			
	<u>UMTA 3</u>	<u>STATE</u>	<u>LOCAL</u>	<u>TOTAL</u>
W. Pittsburg/North Concord	198,500	99,250	99,250	397,000
Irvington/Warm Springs	172,500	86,250	86,250	345,000
Castro Valley/Dublin	111,000	55,500	55,500	222,000
San Francisco Airport	<u>338,700</u>	<u>169,350</u>	<u>169,350</u>	<u>677,400</u>
TOTAL	820,700	410,350	410,350	1,641,400

Table III- 12
SUMMARY OF BART RESERVE CASH BALANCES

(Estimate in \$000's for 1991)

	<u>Line Item</u>	<u>Cumulative Total</u>
Cash Balances (Estimated for June 30, 1986)		250,254
- General Construction (Fund 01)*	28,675	
- Basic System Completion (Fund 01)*	9,928	
- System Improvement Reserve	5,584	
- Revenue Bond Construction Fund	178,468	
- Vehicle Fire Hardening Reserve	801	
- Interest Transfer Fund	5,736	
- DC Overrun Reserve/Full Funding Agmt.	8,511	
- DC Construction Fund Allocation	1,754	
- Multi-Year Capital Allocations	10,797	
Anticipated Interest		32,200
Capital Allocations from Operating Budget		7,323
Estimated Balance for Expenditures		289,777
BART Obligations, Local Shares, and Costs		272,989
Unavailable from Grant Sources, and Net Project Costs		
Contingency Funds (Balance)		
- DC Full Funding Grant Agreement		8,511
- General		8,277
Total		16,788

*Interest accrues to the Bond Fund and is available in the five year period; however, reserve balances do not change from year to year to reflect this since the interest does not actually accrue to the specific reserve.

APPENDIX A

BART MAINTENANCE PROGRAM



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I. Introduction

BART presently operates a 72 mile heavy rail transit system with 440 revenue vehicles. In addition to maintenance of revenue vehicles, it must maintain all the support facilities which comprise the District as a whole. These include communication systems (radio and landline), automobiles, trucks, tracks, structures, subways, tunnels, power distribution systems (AC and DC), grounds, buildings, parking lots, fare collection equipment, computers, air distribution systems, pumps, lights, and the list is almost endless. To accomplish these tasks, BART has developed an integrated maintenance program that provides for the required maintenance and repair to be performed and documented.

The BART maintenance goal is to ensure that all equipment is properly maintained and modified if necessary, to maximize its performance and longevity. This is accomplished by an established review process that ensures equipment is performing as planned, through a non-deferable preventative maintenance program and making repairs as required. These maintenance requirements are constantly monitored by Engineers and management to ensure that the appropriate work is being accomplished. To support these activities, BART documents performance and maintenance activities completely, so equipment performance can be analyzed regularly to identify undesirable trends before they become a problem. Encompassed within this plan are details of the maintenance organization, how responsibilities are divided, description of the level of effort for major systems and description of departmental interfaces that implement the BART maintenance program.

II. Maintenance Philosophy

Driving any maintenance program is the underlying philosophy by which an organization operates. Simply stated, BART's system is to have an engineered documented and managed program that will not be deferred. To implement this philosophy, the District has integrated a variety of other supporting philosophies to support our primary mission.

A. Budget

The District is committed to properly financing maintenance. From the Board of Directors down, it receives priority attention. Last year the District committed more than 40% of its operating funds to maintenance.

B. Engineering Support

The District divides its Engineering effort to ensure that maintenance receives appropriate support. At present 24 Engineers are dedicated to direct maintenance support, (12 revenue vehicle, 12 wayside and other systems). These Engineers work daily with Maintenance personnel to solve problems, analyze failures, develop maintenance procedures and implement changes.

In addition, an Engineering Department exists which supports many of the long-range activities and provides design support for projects as they are identified.

C. Preventative Maintenance

No maintenance program can be effective without a well designed and enforced preventative maintenance program. At BART, preventative maintenance will always be accomplished on time. Deferred preventative maintenance is not accepted. Preventative maintenance requirements are developed by Engineers in conjunction with Maintenance Management and performance is monitored to ensure adequacy. Changes are made as required to address a changing environment.

D. Reliability Tracking

Equipment reliability is the ultimate goal of all maintenance programs. To ensure that equipment is performing as planned, all relevant data about maintenance activities and equipment performance is entered into a computer. BART's Reliability Engineering Division primary function is to monitor and report performance parameters. Reports take the form of daily, weekly, and quarterly publications along with a variety of special reports that are intended to focus on special performance parameters. This reporting network ties all levels of management to a common performance criteria and keeps system performance in the forefront of daily activities.

E. Repairs

It is understood that failures will occur. Our maintenance philosophy is to be prepared to react to unscheduled maintenance as a matter of course with reasonable turnaround to keep the required amount of equipment available at all times. This philosophy has translated into one of the best car and wayside utilization records for rail transit in the country.

F. Modification

It is sometimes easy to look at a relatively small problem and think that a change is necessary to correct it by modification. BART's philosophy is that all things will fail at some rate. The overriding point is whether that rate significantly impacts operations. We endeavor to avoid expensive changes which have marginal return. Great effort is put into the concept that we "fix only what is broken" i.e., only change those things which will give a return on the investment or provide greater safety. Lesser failures must be worked on at fault tolerance level.

This means that available dollars or staff are focused to maximize our effectiveness. The management of this concept starts at the top with the Project Review Board which oversees all District projects over \$25,000 and ensures that proper focus and control is maintained.

G. Staffing

To support the maintenance program, BART has a skilled labor force that is trained to accomplish the required tasks. The staffing needs of each department are regularly reviewed to ensure that adequate staff is present to support all planned projects and required tasks. The District historically has not hesitated to add maintenance staff to respond to its needs. The success of our existing maintenance program has not made this requirement necessary in recent years. Since 1976 BART has increased the number of daily trains by 30% and the number of total car hours by 57%, but total direct maintenance staff has decreased by 12%.

H. Training

The District has a comprehensive maintenance training program to ensure that skills are developed to an acceptable level. This includes a certification program for the Maintenance staff, and specific training for District personnel to advance their knowledge in areas required in the performance of their duties. A Technical Training staff of 16 people provide this service. In addition to Technical Training, BART also has a General Training Department which teaches a variety of courses to improve the administrative integrity of BART personnel. Additional amplification of the training program is provided as an attachment.



III. Organizational Breakdown

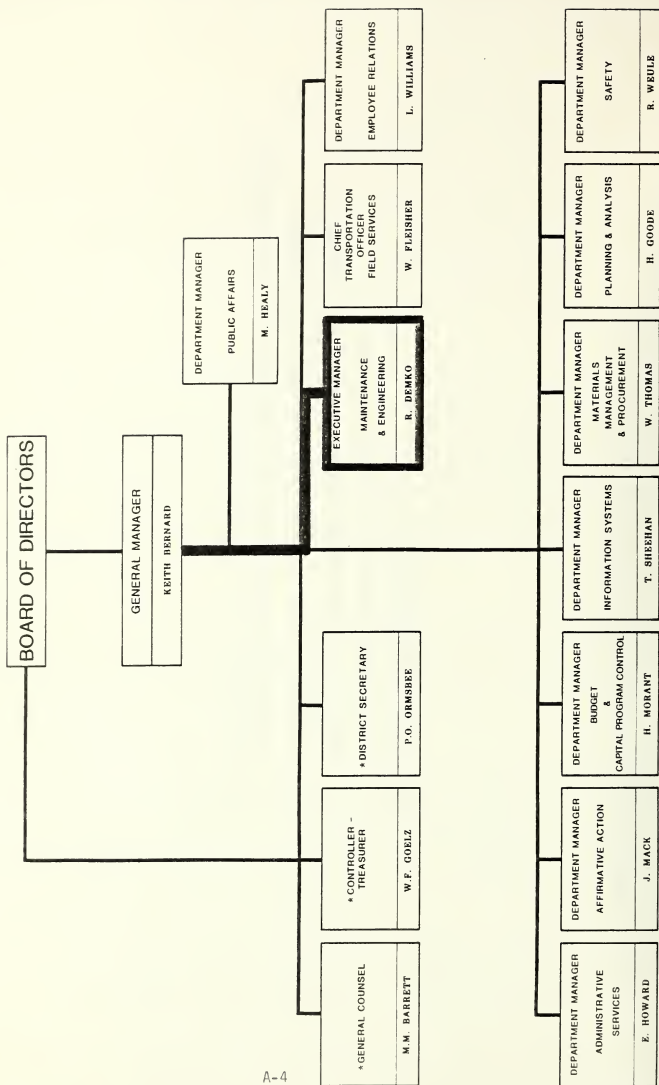
The Maintenance Departments and their primary support

functions are combined within Maintenance & Engineering headed by

R. P. Demko, Executive Manager, BART. The organizational charts

in this section are designed to give a picture of how each is organized, staffed and its areas of responsibility.

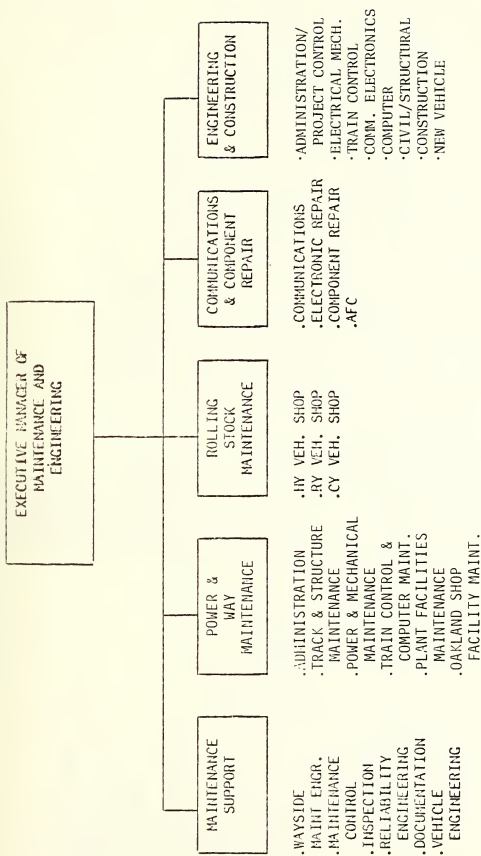
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

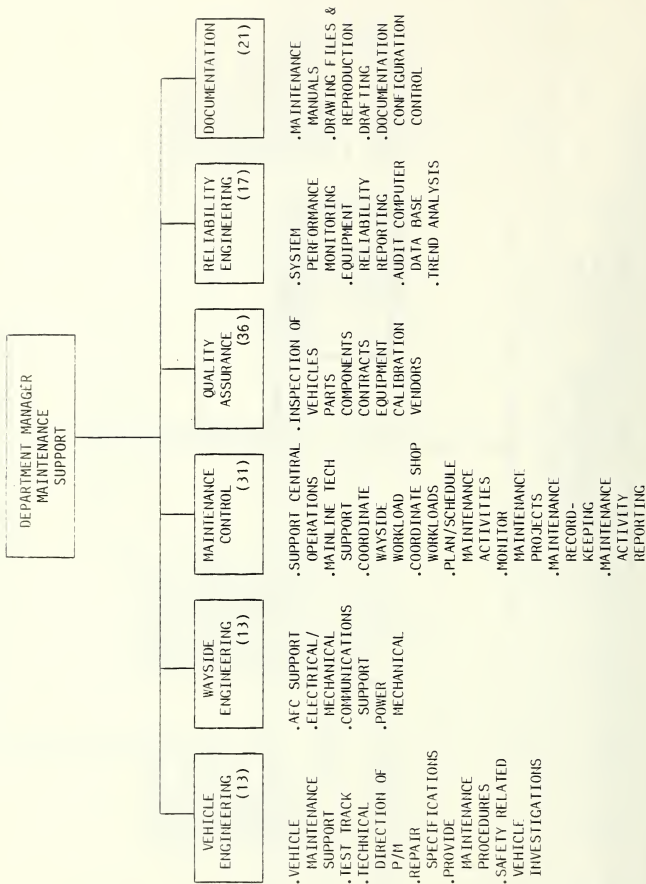


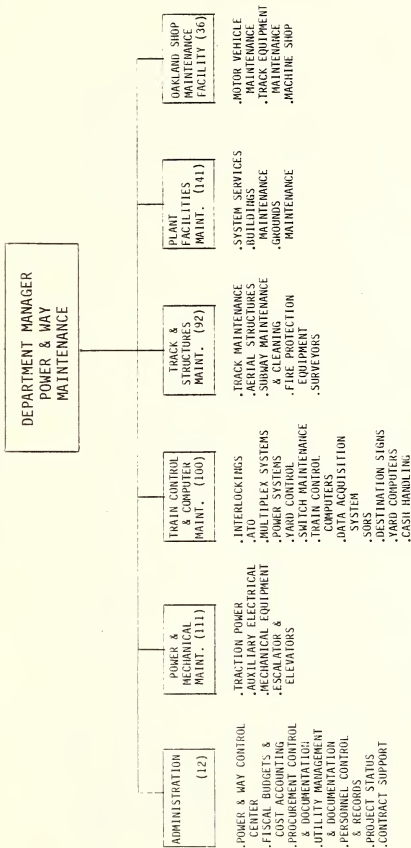
A-4

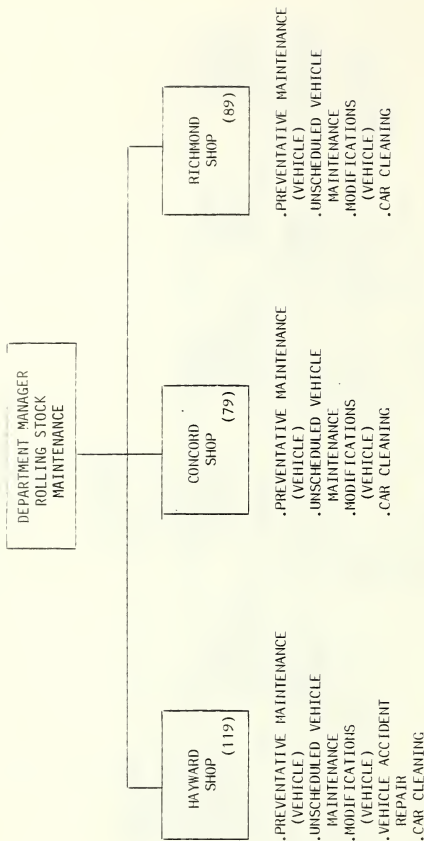
* BOARD APPOINTEE

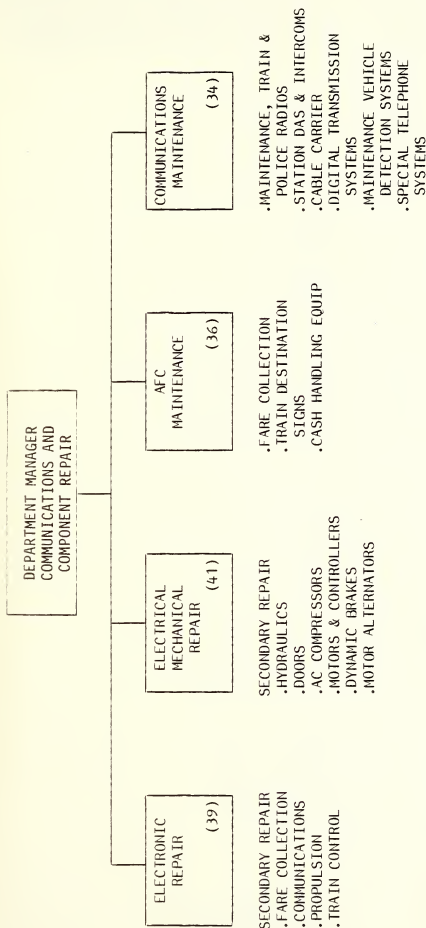
Keith Bernard
KEITH BERNARD
JUNE 23, 1981











DEPARTMENT MANAGER
ENGINEERING &
CONSTRUCTION

TRAIN
CONTROL
ENGINEERING
(14)

- DESIGN CHANGES & MODIFICATION TO CENTRAL, WAYSIDE & VEHICLE TRAIN CONTROL SYSTEMS

ELECTRICAL/
MECHANICAL
ENGINEERING
(13)

- FACILITY ELECTRICAL/MECHANICAL
- TRACTION POWER
- CATHODIC PROTECTION

COMPUTER
SYSTEMS
ENGINEERING
(14)

- EXPANSION OF CENTRAL CONTROL CAPABILITIES FOR ENHANCED SYSTEMWIDE TRAIN SUPERVISION

NEW
VEHICLE
ENGINEERING
(5)

- NEW "C" CAR PROJECT

ELECTRONICS/
COMMUNICATION
ENGINEERING
(14)

- ELECTRONICS
- TELECOMMUNICATIONS
- RADIO COMMUNICATIONS
- FARE COLLECTION
- CASH HANDLING

CONSTRUCTION
ENGINEERING
(12)

- CONSTRUCTION MANAGEMENT
- INSPECTION

CIVIL
STRUCTURAL/
DESIGN
ENGINEERING
(12)

- CIVIL AND STRUCTURAL DESIGN
- CONTRACT PREPARATION

ADMINISTRATION/
PROJECT
CONTROL
(10)

- PROJECT BUDGETS
- ENGINEERING CONTRACTS
- CONTRACTOR PAYMENT APPLICATIONS
- PROJECT SCHEDULE STATUS & FINANCIAL
- FORCE ACCOUNT SUPPORT PLANS
- CASH FLOW PROJECTIONS
- UMTA FORCE ACCOUNT PLANS
- TRACK ACCESS SCHEDULING

IV. Major Maintenance Activities

To describe the level of effort given to maintenance and provide a picture of the complexity of the maintenance program at BART the following tables were prepared for major maintenance activities.

MAJOR SYSTEMS AND MAINTENANCE ACTIVITIES

DESCRIPTION	ACTIVITY	AMOUNT	FREQUENCY	WORK LOCATION	ESTIMATED M/HR\$-YR
ROLLING STOCK MAINT.					
Revenue Vehicle	Vehicle PM	440 Cars	500 Hrs.	All Shops	66,547
	Veh. Unsch. Maint.	"	As Failed	All Shops	195,600
	Veh. Accd. Repair	"	As Required	Hayward Shop	3,000
	Veh. Vandalism	"	As Required	All Shops	10,000
	Veh. Modification	"	As Scheduled	All Shops	15,500
	Car Cleaning	"	Daily	All Yards	47,800
COMM. & COMP. REPAIR					
ATO Vehicle	PM	342	Annually	ERS-Hayward	2,100
Component Maint.	Unsch. Maintenance	1,648	As Required	ERS-Hayward	8,200
ATC - Wayside	PM	2,330	Annually	ERS-Hayward	6,600
Comp. Maintenance	Unsch. Maintenance	2,019	As Required	ERS-Hayward	11,500
Communication Equip.	PM	915	Annually	ERS-Hayward	1,300
Components	Unsch. Maintenance	1,728	As Required	ERS-Hayward	14,500
Vehicle Propulsion	PM	112	Annually	ERS-Hayward	800
Components	Unsch. Maint.	3,699	As Required	ERS-Hayward	12,500
Hyd.					
	Unsch. Maint.	4,070	As Required	ERS-Hayward	17,400

DESCRIPTION	ACTIVITY	AMOUNT	FREQUENCY	WORK LOCATION	ESTIMATED M/HR\$YR
Door & Misc. Hardware					
Repair for RV	Unsch. Maint.	340	As Required	EMRS-Hayward	2,400
Elec. Mech. Comp.					
from Revenue Vehicle	Unsch. Maint.	8,609	As Required	EMRS-Hayward	43,400
	Mods. & Updates	303	As Required	EMRS-Hayward	3,800
	Spec. Proj. & Ser.	761	As Required	EMRS-Hayward	1,200
A/C Comp. Repair, RV	Unsch. Maint.	407	As Required	EMRS-Hayward	11,100
Supervisory Control	PM	237	Mo/Qtr/Semi	Systemwide	2,868
Systems (DTS, MWDD,					
Recorders, Modems)	Repair	-	As Required	Systemwide	1,680
Radio Systems	PM	350	Annual	Systemwide	1,600
(Train, Maint.,					
Yard, Police)	Repair	-	As Required	Systemwide	4,724
Station Comm.	PM	105	Mo/Qtr/Semi	Systemwide	800
(PA, ICS, Monitors)	Repair	-	As Required	Systemwide	7,388
Telephone Systems	PM	140	Mo/Qtr/Semi	Systemwide	2,469
(Maint, Emerg, Other)	Repair	-	As Required	Systemwide	2,184

DESCRIPTION	ACTIVITY	AMOUNT	FREQUENCY	WORK LOCATION	ESTIMATED M/HRS/YR
Carrier & Wayside (Cable Plant)	PM	63	No/Qtr/Semi	Systemwide	2,742
Carriers)	Repair	-	As Required	Systemwide	2,782
AFC MAINT (Incl. Comp. for Tlc. Vend. Gates, Addfare, Changers, etc)	PM	868	Annually	ERS-Hayward	3,500
	Unsch. Maintenance	2,128	As Required	ERS-Hayward	13,000
	Acceptance Testing	2,000	As Required	ERS-Hayward	500
ATO Veh. Comp. Maint.	PM	342	Annually	ERS-Hayward	2,100
	Unsch. Maint.	1,648	As Required	ERS-Hayward	8,200
ATC Wysz Comp. Maint.	PM	2,330	Annually	ERS-Hayward	6,600
	Unsch. Maint.	2,019	As Required	ERS-Hayward	11,500
Comm. Comp. Maint.	PM	915	Annually	ERS-Hayward	1,300
	Unsch. Maint.	1,728	As Required	ERS-Hayward	14,500
Vehicle Prop.	PM	112	Annually	ERS-Hayward	800
Component Maint.	Unsch. Maint.	3,699	As Required	ERS-Hayward	12,500
Destination Signs	PM	284	Quarterly	All Stations	2,840
	Repair		As Required	All Stations	1,200

DESCRIPTION	ACTIVITY	AMOUNT	FREQUENCY	WORK LOCATION	ESTIMATED M/HR/HR
POWER & WAY MAINTENANCE Power & Mechanical Maint. Div.					
Power Facilities	PM	64 facilities 150 mile rail and transmission cable	Dly/Wky/Mo/Qtr/ Semi-Ann/Annually	System-wide	49,878
	Repair				14,068
Elec. Auxiliary	PM	42 facilities	Mo/Qtrly/ Semi-Ann/Annually	System-wide	27,076
	Repair				19,455
Mech. Auxiliary	PM	42 facilities	Mo/Qtrly/ Semi-Ann/Annually	System-wide	26,683
	Repair				18,807
Elevator/Escalator	PM	134Escalators 64 Elevators	Wkly/Mo/Qtrly/ Semi-Ann/Annually	System-wide	19,107 15,637
					177,711

DESCRIPTION	ACTIVITY	AMOUNT	FREQUENCY	WORK LOCATION	MTHRS/YR
Oakland Shop Maint. Facility Div.					
Sedans	Unsch. Repair	97	As required	O K S	4,424
	PM		6000 mi.	O K S	3,620
Lt.Trucks	Unsch. Repair	128	As required	O K S	5,865
	PM		6000 mi.	O K S	4,778
Heavy Equip.	Unsch. Repair	104	As required	O K S	11,225
	PM		30 days - 100 Hrs.	O K S	7,483
Portable Equip.	Unsch. Repair	123	As required	O K S & system wide	1,248
	PM		30 - 90 days	O K S & system wide	877

MACHINE-FABRICATION SHOP:

District Equipment	Modification	260	As required	O K S	2,080
	Repairs	780	As required	O K S	4,160

<u>DESCRIPTION</u>	<u>ACTIVITY</u>	<u>AMOUNT</u>	<u>FREQUENCY</u>	<u>WORK LOCATION</u>	<u>ESTIMATED M/HR/HR</u>
Train Control & Computer Maint. Div.					
<u>YARD CONTROL</u>	PM	172	DLY/WK/MO/SEMI-AN/AN	YARDS	9,946
<u>SYSTEM</u>	UNSCH.	172	AS REQUIRED	YARDS	4,119
<u>T/C RM INSPECT</u>	PM	41	WEEKLY	SYSTEM WIDE	6,102
<u>ROUTE PROHIBITS</u>	AS REQUIRED				
	AS REQUIRED	26	DAILY	SYSTEM WIDE	1,872
<u>ENG. MODS</u>	UNSCH.	38	AS REQUIRED	SYSTEM WIDE	720
<u>DISPLAY BOARD</u>	PM	1	MO.	SYSTEM WIDE	2,600
	UNSCHED.	1	AS REQUIRED	SYSTEM WIDE	6,160
<u>SOR</u>	PM	70	MO.	SYSTEM WIDE	2,940
	UNSCH.	70	AS REQUIRED	SYSTEM WIDE	1,260
<u>DAS</u>	PM	36	MO.	SYSTEM WIDE	3,200
	UNSCH.	36	AS REQUIRED	SYSTEM WIDE	1,900

<u>DESCRIPTION</u>	<u>ACTIVITY</u>	<u>AMOUNT</u>	<u>FREQUENCY</u>	<u>WORK LOCATION</u>	<u>ESTIMATED M/HRS/YR</u>
<u>DSS</u>	<u>PM</u>	<u>40</u>	<u>MO.</u>	<u>SYSTEM WIDE</u>	<u>3,360</u>
	<u>UNSCCH.</u>	<u>40</u>	<u>AS REQUIRED</u>	<u>SYSTEM WIDE</u>	<u>1,440</u>
<u>TRAIN CONTROL COMPUTER SYS.</u>	<u>PM</u>	<u>3</u>	<u>DAY/MO.</u>	<u>LMA</u>	<u>3,850</u>
	<u>UNSCCH.</u>	<u>3</u>	<u>AS REQUIRED</u>	<u>LMA</u>	<u>1,650</u>
<u>YARD COMPUTER</u>	<u>PM</u>	<u>3</u>	<u>MO.</u>	<u>YARDS</u>	<u>2,400</u>
	<u>UNSCCH.</u>	<u>3</u>	<u>AS REQUIRED</u>	<u>YARDS</u>	<u>900</u>
<u>ENG. MOD</u>	<u>UNSCCH.</u>	<u>38</u>	<u>AS REQUIRED</u>	<u>SYSTEM WIDE</u>	<u>700</u>

* DOES NOT INCLUDE NEW SW FOR KE.

<u>DESCRIPTION</u>	<u>ACTIVITY</u>	<u>AMOUNT</u>	<u>FREQUENCY</u>	<u>WORK LOCATION</u>	<u>ESTIMATED M/HR/yr</u>
WAYSIDE MUX	PM	1750	ANNUAL	SYSTEM WIDE	10,879
	UNSCH. REPAIR	1750	AS REQUIRED	SYSTEM WIDE	4,517
STATION MUX	PM	87	QTRLY	SYSTEM WIDE	1,657
	UNSCH.	87	AS REQUIRED	SYSTEM WIDE	685
MAINT. ATO/ATC	PM	91	MONTHLY	SYSTEM WIDE	2,644
	UNSCH.	91	AS REQUIRED	SYSTEM WIDE	1,092
INTERLOCKING SYSTEM	PM	38	BI-ANNUAL	SYSTEM WIDE	7,532
	UNSCH.	38	AS REQUIRED	SYSTEM WIDE	3,122
SWITCH MACHINES	PM	782*	DLY/MO/QTR/SEMI- ANN.	SYSTEM WIDE	19,837
	UNSCH.	782	AS REQUIRED	SYSTEM WIDE	7,395
POWER SYSTEMS	PM	139	WK/MO/BI-MOETHLY	SYSTEM WIDE	4,527
	UNSCH.	139	AS REQUIRED	SYSTEM WIDE	78

DESCRIPTION	ACTIVITY	(HILES) AMOUNT	FREQUENCY	WORK LOCATION	ESTMATED M/HR\$ /YR
Track & Structures Maint. Div.					
Track Inspection	P.M.	150	DAILY	SYSTEMWIDE	16640
BOLT TORQUING	P.M.	150	DAILY	SYSTEMWIDE	12480
TRACK SURFACE/GAGING	P.M.	150	DAILY	SYSTEMWIDE	18720
RUST PREVENTION	P.M.	150	DAILY	SYSTEMWIDE	8320
SPENO RAIL GRINDING	P.M.	150	DAILY	SYSTEMWIDE	6240
in house support	support	150	AS REQUIRED	SYSTEMWIDE	4160*
CONTRACTOR SUPPORT	SUPPORT	150	AS REQUIRED	SYSTEMWIDE	2080
CLEAN,LUBE,GRIND,SWITCHES	P.M.	YARD/INTERLOCKINGS	DAILY	SYSTEMWIDE	4160

DESCRIPTION	ACTIVITY	AMOUNT	FREQUENCY	WORK LOCATION	ESTMATED M/HR/HR/YR
WATER CONTROL	PREVENTATIVE		DAILY	SYSTEMWIDE	
(a) Aerial		24.	Daily	Systemwide	2080
(b) Grade	Maintenance	28.6	Daily	Systemwide	9320
(c) Sub Station		1818			4160
Chemical Grouting (Sub Structures)	Preventive Maintenance	8.1	Daily	Systemwide	4160
INVERT CLEANING	ROUTINE	75	DAILY	SYSTEMWIDE	8320
Vent Cleaning	Maintenance				
TRACKWAY SIGNS	ROUTINE MAINTENANCE	75	DAILY	SYSTEMWIDE	5200
SUPPORT	SCHEDULED AND UNSCHEDULED		DAILY	SYSTEMWIDE	4160
WELDERS	ROUTINE MAINTENANCE		DAILY	SYSTEMWIDE	8320
INSPECTION	ROUTINE MAINTENANCE	75	DAILY	SYSTEMWIDE	4160

V. Support Departments

Embodied within any maintenance organization are those services provided by non-maintenance departments that support the program.

Obviously, there are a number of administrative activities that keep an organization going (i.e. Accounting, Employee Relations, Budget, Safety) which will not be discussed in this plan, but there are activities which have a more direct connection to a maintenance plan and serve to implement the process.

Field Services

The following describes Field Services activities which support/interface with BART's maintenance program:

A. Car Failures

Train operators report mainline train failures annunciated on their operator's console and/or those that are obviously affecting their train's performance, to BART Central. Central and the Vehicle Technician representative analyze the problem(s) and advise the Train Operator how he/she can either correct or alleviate the problem or they arrange for the Mainline Electronic Technician (ET) to board the train and correct/monitor the failure. Some problems are corrected temporarily through the use of the system cut-outs on the car control panel. When the train lays up in the yard, the failure is reported by type and car number to the Tower Supervisor who in turn reports them to the Shop Foreworker. The bad order car is uncoupled from all others and delivered to the location requested by Maintenance.

B. Train Wash

Train Operations' goal is to cycle 300 cars per yard per week through the car washers.

C. Public Address/Intercom Failure Detection

Train Operations has a program for detecting and reporting bad order train public address and intercom systems. This task requires the services of two (2) Train Operators, and is performed at a time when there is little or no other yard requirements. Inoperative equipment is reported to shop personnel.

D. Station Operations

AFC or Transfer Machine Equipment Failures

Fingertip maintenance by Agents involve clearing ticket and money jams. No outside help is required for this task.

Machine mechanical failures require an Agent to complete the System & Equipment Incident Report (S.E.I.R.) followed by a phone report to AFC Maintenance in Hayward.

All other equipment failures (elevator/escalators) and buildings and grounds discrepancies are reported on Maintenance Forms by the Agent. The completed form must be followed up by a phone report to the Power and Way Maintenance Control Center.

Information Systems

Information Systems provides essential support and direct interface to BART's maintenance program primarily through the Maintenance and Reliability Information System (MARIS).

At the present time MARIS enhances the tracking and maintainability of BART's transit vehicles and wayside equipment by providing the following services:

1. Tracks fleet status which relates to transit vehicle availability and provides train consist information.
2. Reports failure and reliability statistics which aid in determining appropriate time intervals for preventative maintenance.
3. Aids in scheduling and expediting repairs and preventative maintenance of transit vehicles and wayside equipment.
4. Gives diagnostic aid and pre-staging assistance for maintenance functions by furnishing related transit vehicle history, including a list of tracked maintenance and modified items.
5. For the secondary repair shops, tracks components through the repair cycle to expedite repair by priority of need and to aid in implementing modifications.
6. Identifies components which may need engineering attention.
7. Furnishes BART management with failure trend data and exception reports to assist in improving maintainability of transit vehicles and wayside equipment.

MARIS is in the process of being expanded to accommodate processing of data for the new C-cars with special emphasis upon warranty. Capability will be added for tracking vehicle and wayside components which are subject to measured time change-out.

Training

The BART Training Division (a part of the Employee Relations Department) provides classroom and hands-on training services to all maintenance departments/divisions upon request.

Routine and certification training is provided to Rolling Stocks Maintenance, Train Control, Computer Maintenance, Communications and A.F.C., Power and Support Electrical Maintenance, Track and Structures and Buildings and Grounds.

Training works closely with Vehicle Engineering and Documentation to assure that technical subject matter taught in the classes is current and accurate.

Training will be conducting classes on the C-car and consequently is working very closely with Design Engineering to assure that all relevant topics are taught satisfactorily.

Training is also involved in documenting and developing a training class for the "KE" track.

Provided as an attachment is a list of training courses taught by this department in support of maintenance.

Material Management and Procurement

Performs the logistical functions of the District. The scope of District logistical functions ranges from material planning through all phases of procurement, custody, distribution and control procedures. Typical functions performed for maintenance departments by the Purchasing division are:

1. Vehicle Engineering: Review and comment on specification workability; assist with procedure definitions; resolve Quality Assurance exceptions with vendors; coordinates project communications with vendors; purchase and expedite materials and services; develops alternate sources.
2. Direct maintenance (RSM, C&CR, P&W): Purchase and expedite materials and services; negotiate adjustments with vendors and secure information from the market place.
3. Maintenance Planning: Supply information on availabilities and lead times plus some expediting.

Typical functions performed for maintenance departments by Contract Management division are:

1. Vehicle Engineering: Development of commercial and technical specifications; bidding and contract administration.
2. Direct maintenance (RSM, C&CR, P&W): Procurement of plant and capital equipment. Development of repair contracts; bid and contract administration.
3. Maintenance Planning: Participates in planning for capital spares.

Typical functions performed for maintenance departments by Material Administration division are:

1. Vehicle Engineering: Makes up and stocks parts kits for modifications; provides usage history on parts; puts new items in stock; holds materials in custody, transports, issues and receives as required.
2. Direct maintenance (RS&R, C&CR, P&W): Maintains maintenance parts inventory; issues, receives, transports and distributes material and equipment; scraps spent supplies and equipment for repair operations and outside repair contract; backorders and reorders parts; prepares parts status lists; assembles and issues modification kits.
3. Maintenance Planning: Prepares parts status reports and usage reports; input Maintenance Monthly Plan.

Planning and Analysis

The Planning Division of the Planning and Analysis Department is responsible for financing the BART capital program and its presentation to MTC for incorporation into the Regional Transportation Plan. The Planning Division provides documentation required by the MTC/UMTA grant review process and provides necessary liaison between BART and outside agencies leading up to the point where project funding is assured.

The Research section works with Field Services to define future train service levels. This information is then translated into car mile and car hour estimates which are the basis for vehicle maintenance planning. The Research section also prepares the Quarterly Performance Report (QPR) which summarizes progress toward all District objectives, including maintenance objectives dealing with car availability. AFC equipment availability and elevator and escalator availability.

VI. ATTACHMENTS

MAINTENANCE AND RELIABILITY
INFORMATION SYSTEM
(Expansion)

MAINTENANCE AND RELIABILITY INFORMATION SYSTEM

INTRODUCTION

The Maintenance and Reliability Information System (MARIS) is a module of BART's overall computerized management information system.

INTRODUCTION TO MARIS

MARIS is a CRT menu-driven system with optional hard copy printing capabilities at most of the terminal locations. There are eight (8) primary user groups:

- o Trouble Desk
- o Maintenance Control
- o Vehicle Maintenance
- o Wayside Maintenance
- o Secondary Repair
- o Transportation Towers
- o Reliability Engineering
- o Vehicle Maintenance Engineering

MARIS provides data to assist in maintaining reliable transit vehicles and wayside support equipment, as well as providing on-line data to assist management. MARIS terminals are located in:

- o Three Vehicle Shops
- o Three Yard Towers
- o Vehicle Maintenance Engineering
- o Maintenance Control (Hayward Main Shop)
- o Central Operations
- o Wayside Maintenance Shops
- o Reliability Engineering and
- o Secondary Maintenance

Regular users of MARIS information include:

- o Maintenance Control Schedulers
- o Shop Foremen
- o Shop Superintendents
- o Reliability Engineering and Quality Assurance Staff
- o Engineering Design and Support Staff
- o Maintenance and Engineering Management
- o Field Services Personnel
- o Planning and Research Staff
- o APTA's Trip Program Participants
- o Safety Personnel
- o Legal Staff
- o Materials Management Personnel

MARIS AT THE PRESENT TIME

The existing system was developed to enhance the tracking and maintainability of BART's transit vehicles and wayside equipment by providing the following services:

- (a) Tracks fleet status which relates to transit vehicle availability and provides train consist information.
- (b) Reports failure and reliability statistics which aid in determining appropriate time intervals for preventative maintenance.
- (c) Aids in scheduling and expediting repairs and preventative maintenance of transit vehicles and wayside equipment.
- (d) Gives diagnostic aid and pre-staging assistance for maintenance functions by furnishing related transit vehicle history, including a list of deferred maintenance and modified items.
- (e) For the secondary repair shops, tracks components through the repair cycle to expedite repair by priority of need and to aid in implementing modifications.
- (f) Identifies components which may need engineering changes.
- (g) Participates in industry related reliability and failure analysis (e.g., APTA's TRIP).
- (h) Furnishes BART management with failure trend data and exception reports to assist in improving maintainability of transit vehicles and wayside equipment.

MARIS IS DIVIDED INTO SIX FUNCTIONAL AREAS:

(a) Consist Tracking

- o Status and location of consists and the transit vehicles they contain
- o Collection of consist failure and history data

(b) Transit Vehicle Tracking

- o Status and location of transit vehicles
- o Collection of reliability and failure data
- o Incident tracking and reporting
- o Failure and repair history

(c) Transit Vehicle Maintenance

- o Status of the maintenance being performed on a transit vehicle
- o Daily and weekly input on maintenance workload and scheduling

(d) Wayside Equipment Maintenance

- o Status and location of wayside equipment
- o Daily and weekly input on maintenance workload and scheduling

(e) Secondary Repair

- o Status and location of repairable parts
- o Daily and weekly input on maintenance workload and scheduling
- o Repairable item tracking
- o Control over repairable and consumable parts
- o Component reliability analysis

(f) PM Scheduling Support

- o Daily and weekly input and update on workloads and scheduling of transit vehicles and wayside equipment maintenance
- o Maintenance planning and management
- o Planning and scheduling of routine maintenance in primary and secondary shops

The software for MARIS consists of a mixture of on-line, interactive programs and batch programs. Data for the system resides in a mix of on-line and batch data bases and magnetic tape archive files.

There are four groups of DL/I data bases which address:

- o Consists
- o Transit vehicles
- o Wayside equipment
- o Components

PLANNED CHANGES AND ENHANCEMENTS TO MARIS

The District has ordered 150 new transit vehicles of a different kind than those in the present fleet. The new cars have been designated Type "C" cars as opposed to the existing "A" and "B" types of cars.

MARIS must accommodate the processing of data for the new cars in the following areas:

- o Warranty Management
- o Time Control Management
- o New functions such as split train and component verification

New software must be developed to handle these areas. New data bases will be required for some of these areas of development. Approximately, twelve existing MARIS programs will require modification to handle "C" car data.

This system expansion also calls for extending data base maintenance capability, and changing segment access methodology for equipment history functions from first in, first out (FIFO) to last in, first out (LIFO).

MARIS services a great variety of needs. The computer application system aspect of MARIS of necessity is complex. At the present time, there are more than 45 basic functions (e.g., Fleet Status, Vehicle Status). In addition many of the functions have several options. More functions will be added as part of the MARIS Expansion Project.

MAINTENANCE TRAINING

COURSE DESCRIPTIONS

D. COMMUNICATIONS ELECTRONIC TECHNICIANS (CET's)

TITLE:

1. TRAIN RADIO

OVERALL OBJECTIVES: To assure that Communications Electronic Technicians (CET's) maintain an acceptable level of knowledge in the proper maintenance and repair of Train Radio Communication Systems.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids and some hands-on application.

EXAMINATION: Written examinations covering the Train Radio System, its functions and troubleshooting.

TARGET AUDIENCE: Communications Electronics Technician: (CET's) assigned to the Communications Section.

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. Train Radio Base Sections and all associated equipment
2. Station Antennas and Feed Arrangements
3. TCC (Train Control Console) at Central
4. Console Support Equipment at LMA Toll Test Board RR #2
5. Radio Test Equipment
6. Keying Systems
7. System Troubleshooting
8. Module Adjustment
9. Adjustment of Base Station Transmitter
10. FCC Documentation
11. Safety Procedures
12. Clearance Procedures
13. Audio Adjustments

COURSE LENGTH: Forty (40) Hours (May be taught in full length or modular form)

TITLE:

2. MAIN DISTRIBUTOR FRAME

OVERALL OBJECTIVES: To assure that Communications Electronic Technicians (CET's) maintain an acceptable level of knowledge in the proper maintenance and repair of the Main Distributor Frame and its functions.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids and some hands-on application on the Main Distributor Frame at the Lake Merritt Toll Test Board.

EXAMINATION: Written examinations covering the Main Distributor Frame, its functions and troubleshooting.

TARGET AUDIENCE: Communications Electronics Technicians (CET's) assigned to the Communications Section.

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. Quality Control Standards with Regard to the Main Distributor Frame
2. Main Distributor Frame Documentation
3. System Security
4. Clearance Required
5. Carrier Voltage Considerations

COURSE LENGTH: Four (4) Hours

TITLE:

3. BART TELEPHONE SYSTEM

OVERALL OBJECTIVES: To assure that Communications Electronic Technicians (CET's) maintain an acceptable level of knowledge in the proper maintenance and repair of the BART Telephone System.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids and some hands-on application.

EXAMINATION: Written examinations covering BART's Telephone System, its functions and troubleshooting.

TARGET AUDIENCE: Communications Electronics Technicians (CET's) assigned to the Communications Section.

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. General Telephone Theory
2. Hybrids
3. Transformers/Loading Coils
4. Telephone Line Characteristics
5. Maintenance Telephones
6. Emergency Telephones
7. OPL/PABX Telephones
8. Red/Green/Yellow/Black and Mine Telephones
9. PBX's
10. Networks
11. Telephone Test Equipment
12. Common Battery
13. Local Battery
14. CB/LB Interface
15. MT Switchboard
16. ET Console
17. TTB Equipment
18. Signaling
19. Dials
20. E-M Trunk Signaling
21. Troubleshooting Telephone Systems

COURSE LENGTH: Forty (40) Hours (May be taught in full length or modular form)

TITLE:

4. BART DIGITAL TRANSMISSION SYSTEM

OVERALL OBJECTIVES:

To assure that Communications Electronic Technicians (CET's) maintain an acceptable level of knowledge in the proper maintenance and repair of the BART Digital Transmission System.

COURSE FORMAT:

Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids visual inspection of actual equipment and limited hands-on application.

EXAMINATION:

Written examinations covering BART's Digital Transmission System, its functions and troubleshooting.

TARGET AUDIENCE:

Communications Electronics Technicians (CET's) assigned to the Communications Section.

CYCLE:

Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. General Considerations of the Digital Transmission System (DTS)
2. Review of Digital Logic
3. Functions of the Digital Transmission System
4. Block Diagrams of the DTS
5. Identification of the Components of the DTS
6. DTS Interface
7. DTS Test Equipment
8. DTS Troubleshooting
9. DTS Documentation
10. DTS Circuit Analysis
11. DTS Safety Precautions
12. Failsafe
13. Lost Interrupt
14. Work "31"
15. DTS Modems
16. DTS Backup Panel
17. DTS Backup Lines
18. DTS Key Functions
19. DTS Addressing
20. DTS Word Format

COURSE LENGTH:

Forty (40) Hours (May be taught in full length or modular form)

TITLE:

5. BART K-24 CARRIER SYSTEM

OVERALL OBJECTIVES: To assure that Communications Electronic Technicians (CET's) maintain an acceptable level of knowledge in the proper maintenance and repair of the BART K-24 Carrier System.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids visual inspection of actual equipment and limited hands-on application (first week).

Field training (Task Training Week) in a field environment with the instructor directing terminal/repeater measurement/adjustment for the first night. The involvement of the instructor will be on a diminishing basis as the week progresses.

EXAMINATION: Written examinations covering BART's K-24 Carrier System, its functions and troubleshooting.

TARGET AUDIENCE: Communications Electronics Technicians (CET's) assigned to the Communications Section.

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. General Considerations of "Carrier" Systems
2. Type of "Carrier" Systems
3. Modulation Systems
4. Block Diagrams of the K-24 System
5. Modulation Plan
6. Frequency Conversion
7. Balanced Modulators/Demodulators
8. System Block Diagrams Including Signaling
9. Module Block Diagrams
10. Alarm Systems
11. Power Systems
12. Power Feed System
13. Repeater Block System
14. Repeater Slope and Span Pads
15. Circuit Analysis of Modules
16. Repeater/Amplifier Pad Calculations
17. Test Equipment

COURSE LENGTH: Forty (40) Hours Classroom
Forty (40) Hours Task Training
Eighty (80) Hours Total (May be taught in full length or modular form)

TITLE:

6. ELECTRONIC KTS TELEPHONE SYSTEM

OVERALL OBJECTIVES: To assure that Communications Electronic Technicians (CET's) maintain an acceptable level of knowledge in the proper maintenance and repair of the Electronic KTS Telephone System.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids, available documentation and spare parts.

Part of this training will be conducted on-site at both Central and the Toll Test Board Room.

EXAMINATION: Written examinations covering the Electronic KTS Telephone System, its functions and troubleshooting.

TARGET AUDIENCE: Communications Electronics Technicians (CET's) assigned to the Communications Section.

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. ITT MKS131 System Block Diagrams
2. Station Equipment
3. Line Equipment
4. Intercommunications Equipment
5. Common Equipment
6. Power Supplies
7. Documentation
8. Strapping Options
9. Safety Considerations
10. System Troubleshooting
11. Data Transmission

COURSE LENGTH: Twenty (20) Hours (May be taught in full length or modular form)

TITLE:

7. THIRD RAIL POWER TRIP SYSTEM

OVERALL OBJECTIVES: To assure that Communications Electronic Technicians (CET's) maintain an acceptable level of knowledge in the proper maintenance and repair of the Third Rail Power Trip System.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids, visual inspection of actual equipment and limited hands-on application.

EXAMINATION: Written examinations covering the Third Rail Power Trip System, its functions and troubleshooting.

TARGET AUDIENCE: Communications Electronics Technicians (CET's) assigned to the Communications Section.

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. Operations Rules and Procedures
2. Rail Trip System Configuration
3. Interface with DTS
4. Relay Controls
5. Traction Power
6. Troubleshooting Procedures
7. Troubleshooting Exercises
8. Safety Precautions
9. Analysis of Past Incidents

COURSE LENGTH: Sixteen (16) Hours (May be taught in full length or modular form)

TITLE:

8. WORKMANSHIP

OVERALL OBJECTIVES: To assure that Communications Electronic Technicians (CET's) maintain an acceptable level of knowledge in proper Workmanship Procedures and practices.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids, and actual chassis construction techniques in a work area.

EXAMINATION: Written examinations covering workmanship practices and standards.

Student-assembled chassis are inspected for workmanship and quality control standards as applicable to BART.

TARGET AUDIENCE: Communications Electronics Technicians (CET's) assigned to the Communications Section.

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. Crimping
2. Wire Wraps
3. Soldering
4. Component Mounting
5. Component Marking
6. Hardware Installation
7. BART Quality Standards
8. Construction Documentation

COURSE LENGTH: Sixteen (16) Hours (May be taught in full length or modular form)

TITLE:

9. BART POLICE RADIO SYSTEM

OVERALL OBJECTIVES: To assure that Communications Electronic Technicians (CET's) maintain an acceptable level of knowledge in proper maintenance and repair of the Police Radio System.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids, and some hands-on application.

EXAMINATION: Written examinations covering the BART Police Radio System, its functions and troubleshooting.

TARGET AUDIENCE: Communications Electronics Technicians (CET's) assigned to the Communications Section.

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. Security Radio Base Stations and All Associated Equipment
2. Station Antennas and Feed Arrangements
3. BPS Console and All Associated Equipment
4. Radio Test Equipment
5. Keying Systems
6. System Troubleshooting
7. Module Adjustment
8. Adjustment of a Base Station Transmitter
9. FCC Documentation
10. Safety Procedures
11. Clearance Procedures
12. Audio Adjustments

COURSE LENGTH: Forty (40) Hours (May be taught in full length or modular form)

E. ELECTRICIANS

TITLE:

1. ELECTRICAL COMPONENT FAMILIARIZATION AND BASIC PROCEDURES

OVERALL OBJECTIVES:

To assure that Electricians maintain an acceptable level of knowledge in proper maintenance and repair of BART's Electrical Power Systems.

COURSE FORMAT:

Classroom and field familiarization is utilized along with handouts, visual aids, and some hands-on application.

EXAMINATION:

Written examinations covering the basic Electrician Procedures for maintaining BART's Electrical Power System.

TARGET AUDIENCE:

Maintenance Electricians

CYCLE:

Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. BART Operations Rules and Procedures as they apply to Electricians (orange book)
2. BART Electrification Plans (red book)
3. BART's Safety Tagging System
4. 1KV DC, 34.5 KV AC, Rectifier and Breaker Safe Clearances
5. Introduction to BART Electrical Prints and Documentation
6. BART's Substation Rectifier System Familiarization Monitoring Devices and Safety
7. BART's Substation Transformer System Familiarization, Monitoring Devices and Safety
8. 34.5 KV DC Switchgear Maintenance and Operation
9. 1 KV DC Switchgear Maintenance and Operation
10. Safe Substation Battery Charger Maintenance and Operation
11. Substation Battery System Maintenance and Operation

COURSE LENGTH:

Forty (40) Hours (May be taught in full length or modular form)

F. TRAIN CONTROL ELECTRONICS TECHNICIANS (TCET's)

TITLE:

1. SWITCH MACHINE TRAIN CONTROL EQUIPMENT

OVERALL OBJECTIVES: To assure that Train Control Electronics Technicians (TCET's) maintain an acceptable level of knowledge in proper maintenance and repair of Switch Machines and their associated equipment.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids, and some hands-on application.

EXAMINATION: Written examinations covering Train Control Switch Machines, their functions and troubleshooting.

TARGET AUDIENCE: Train Control Electronics Technicians (TCET's) assigned to the Communications Section.

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. Basic Hardware Layout
2. Component Parts of Track
3. GRS Model 55 Switch Machine
4. GRS Speed Frater Switch Machines

COURSE LENGTH: Twenty-Four (24) Hours (May be taught in full length or modular form)

TITLE:

2. INTERLOCKING TRAIN CONTROL EQUIPMENT

OVERALL OBJECTIVES:

To assure that Train Control Electronics Technicians (TCET's) maintain an acceptable level of knowledge in proper maintenance and repair of Interlocking equipment.

COURSE FORMAT:

Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids, and some hands-on application.

EXAMINATION:

Written examinations covering Train Control Interlocking Equipment, their functions and troubleshooting.

TARGET AUDIENCE:

Train Control Electronics Technicians (TCET's)

CYCLE:

Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. System Introduction
2. Basic Theory of Train Control Interlocking
3. Interlocking Documentation
4. Basic Relay Logic Circuits
5. Interlocking Logic
6. Power Distribution
7. Preventive Maintenance and Acceptance Tests

COURSE LENGTH:

Fifty-Six (56) Hours (May be taught in full length or modular form)

TITLE:

3. MULTIPLEX AND SPEED ENCODING (MUX) TRAIN
CONTROL EQUIPMENT

OVERALL OBJECTIVES: To assure that Train Control Electronics Technicians (TCET's) maintain an acceptable level of knowledge in proper maintenance and repair of MUX equipment.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids, and some hands-on application.

EXAMINATION: Written examinations covering Train Control MUX Equipment, its functions and troubleshooting.

TARGET AUDIENCE: Train Control Electronics Technicians (TCET's)

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. System Introduction
2. Basic Timing Unit
3. Station Speed Encoding Unit
4. Wayside Multiplex System

COURSE LENGTH: Eighty (80) hours (May be taught in full length or modular form)

TITLE:

4. NON-INTERRUPTIBLE POWER SYSTEMS (N.I.P.S.)
TRAIN CONTROL EQUIPMENT

OVERALL OBJECTIVES: To assure that Train Control Electronics Technicians (TCET's) maintain an acceptable level of knowledge in proper maintenance and repair of N.I.P.S. Systems.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids, and some hands-on application.

EXAMINATION: Written examinations covering Train Control Non-Interruptible Power Systems, their functions and troubleshooting.

TARGET AUDIENCE: Train Control Electronics Technicians (TCET's)

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. System Introduction
2. Lead-Acid Batteries
3. Westinghouse Single-Phase Battery Chargers
4. Westinghouse Three-Phase Battery Chargers
5. Westinghouse 1 to 10 KVA Inverters
6. Westinghouse High Power Inverters

COURSE LENGTH: Eighty (80) Hours (May be taught in full length or modular form)

TITLE:

5. AUTOMATIC TRAIN CONTROL OPERATION (ATO)
EQUIPMENT

OVERALL OBJECTIVES: To assure that Train Control Electronics Technicians (TCET's) maintain an acceptable level of knowledge in proper maintenance and repair of ATO Train Control Equipment.

COURSE FORMAT: Classroom setting, instructor-delivered instruction, supplemented with handouts, visual aids, and some hands-on application.

EXAMINATION: Written examinations covering the Train Control Automatic Train Operation System, its functions and troubleshooting.

TARGET AUDIENCE: Train Control Electronics Technicians (TCET's)

CYCLE: Upon initial hiring, every three years or as requested.

TOPICS COVERED:

1. System Introduction
2. Interfacing Equipment
3. Performance Modification and Dwell Time
4. Transmitting I.D. to Train
5. Program Stop and I.D. Transmit
6. I.D. Processors
7. Destination Sign Logic
8. ATO Documentation

COURSE LENGTH: Eighty (80) Hours (May be taught in full length or modular form)

CHAPTER V CERTIFICATION PROCEDURES

GENERAL PROCEDURES

CALIFORNIA PUBLIC UTILITIES COMMISSION (C.P.U.C.)
SEVENTH INTERIM ORDER

The California Public Utilities Commission (C.P.U.C.) issued its Seventh Interim Order, dated May 15, 1977 which, among other things, required the District to establish training, testing and certification programs for personnel whose duties may affect the safety of passengers, employees or equipment. It further required the District to submit to the C.P.U.C. within three months, a specific implementation plan for training and testing programs and certification requirements. In October of 1977 (revised in May 1981), the District issued its C.P.U.C. Certification Plan which specified in some detail how the District would comply with C.P.U.C. Interim Order Seven. The Plan was subsequently approved by the C.P.U.C.

In general, the Plan indicates that all personnel in specific classifications shall be trained and tested by means of classroom, simulation and On-The-Job (OJT) training methods, in five (5) major areas:

- a) District Operations Rules and Procedures
- b) Safety regulations pertinent to the skill
- c) Applicable departmental regulations and procedures
- d) Specific job functions and ability to perform specific job functions
- e) Impact of the employee's actions on safety

Certification and recertification of Central Control Power/Support Controller and Central Train Controllers is currently conducted by the Field Services Department. All other certification and recertification is conducted by the Department of Employee Relations, Training Division.

Specific classifications covered are:

- 1. Computer Technicians
- 2. Traction Power Electricians
- 3. Communications, Revenue Vehicle and Train Control Electronic Technicians
- 4. On-Rail Equipment Operators
- 5. Station Agents
- 6. Tower Supervisors (Foreworkers)
- 7. Line Supervisors (Foreworkers)
- 8. Train Operators
- 9. Transit Vehicle Mechanics

The numbering of personnel in those classifications totals about 1200 employees or 55% of the District's workforce of approximately 2200 employees.

The certification process is divided into two phases: Initial certification, generally given to newly hired or promoted personnel in the above classifications, and recertification, given to those employees on a two or three year cycle thereafter.

District employees required to be certified and recertified must participate in training programs and successfully pass written and performance examinations and an identified OJT Training process. Employees not meeting certification requirements cannot perform the function being certified according to both Interim Order Seven and the C.P.U.C. Certification Plan filed in October 1977 (revised May 1981).

Specific certification curriculum content for Maintenance classifications are selected from the existing Maintenance course curriculum by appropriate Maintenance management personnel.

A P P E N D I X B

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P R O D U C T I V I T Y I M P R O V E M E N T

P R O G R A M S T A T U S

STATUS REPORT
BAY AREA RAPID TRANSIT DISTRICT (BART)
FY 1985/86 PRODUCTIVITY IMPROVEMENT PROGRAM
JULY-DECEMBER 1985 PERFORMANCE

CAPACITY EXPANSION PROGRAM

Operator Description

BART's Capacity Expansion Program is a multi-year effort designed to provide significantly higher system capacity, safety, and reliability, so that many more people can ride throughout the three counties. This long-term program includes a more efficient turnback facility at Daly City with a storage/maintenance yard, 150 new C-Cars, a new integrated train supervision system (ICS), new vehicle automatic train control system, and a third subway track through the Oakland WYE. Additionally, all existing A- and B- cars will be fire hardened as a prerequisite to eliminating the California Public Utilities Commission (CPUC) vent separation requirement. Integral to the Capacity Expansion Program are the Wayside Train Control and System Performance Modifications which were identified by the System Performance Study. This project consists of additional system modifications necessary to facilitate even shorter headway operations without compromising safety and reliability.

Impact: Long-Term

Objective

To realize a greater share of BART's potential through a program to increase capacity, operational efficiency, and flexibility without compromising safety and reliability. Increased level of service consumption relative to a more favorable ratio of service output to service input is expected to result in improved cost-efficiency, cost-effectiveness, and service-effectiveness.

Short-term objective is to maintain adherence to project schedules as indicated by the achievement of programmed interim milestones. These are presented on the following page along with status as of December 1985.

PROJECT TITLE
COMPLETION DATE*
AND FMS NUMBER

SHORT-TERM PIP
FY 85/86 MILESTONE

PROJECT/MILESTONE STATUS
AS OF DECEMBER 1985

- KE Track Nov 1985 #07CB, CG & CD	Project complete by November 1985.	Project completion scheduled for March 1986.
- New ATC Prototype Oct 1985 #42CA	Production release by October 1985.	Project scheduled for completion by March 1986.
- Vehicle Fire Hardening Sep 1986 #41EI	Complete 420 cars by June 1986.	297 cars completed. 407 cars scheduled for completion by June 1986. Project scheduled for completion by October 1986.
- Integrated Control System Jan 1987, Ph. I Dec 1987, Ph. II #61--	Complete software production by April 1986.	Software production completion scheduled for February 1987. Project completion by October 1987 (reflects consolidation of Phases I & II in September 1985).
- C-Cars May 1987 #42AA&	Prototype delivery by August 1985.	Four prototype C-Cars delivered late October 1985. 150-car delivery to be determined.
- Daly City Turnback Dec 1987 #11RD	Complete civil construction by April 1986.	Civil construction scheduled for completion by April 1986. Project to be completed by December 1987.
- Daly City Yard Mar 1988 #11SD	Complete design by November 1985.	Design completed November 1985. Project scheduled for completion by March 1988.

* As identified in June 1985 Project Status Report and September 1985 PIP submittal. Short-term milestone presented in the middle column is the PIP objective. Project completion dates are provided for reference only.

Long-term objective (once capital projects are complete and future service expansion is implemented) is to realize improved levels of cost-efficiency, cost-effectiveness, and service-effectiveness as reflected by the following performance indicators:

PIP INDICATOR	FY 1984/85 ACTUAL	PREVIOUS* FY 1989/90 OBJECTIVE	REVISED* FY 1989/90 OBJECTIVE	JUL-DEC 85 ACTUAL
Passenger Miles Per Seat Mile	35.8%	44.9%	39.1%	35.4%
Passengers Per Car Mile	2.0	2.5	2.2	2.0
Passenger Miles/ KWH (Traction)	4.5	5.9	5.2	4.3
Rail Passenger Revenue/Car Mile	\$2.17	\$2.74	\$3.53	\$2.13

* Previously identified PIP objectives, per the September 1985 PIP submittal, were based on the draft budget projections contained in the Draft 1985 SRTP. Revised PIP objectives are based on the adopted budget which includes the impact of the January 1986 fare increase.

Operator Comments

Train load factor data indicate that BART is essentially operating at capacity during peak periods with virtually all available cars in use to form 43 on-line trains. The system now operates at its current maximum sustainable frequency, 16 trains per hour (3' 45" headway) in the peak direction. Service and capacity expansion beyond this level are limited by a number of critical constraints including an inefficient turnback facility at Daly City, CPUC imposed operating procedures which call for minimum vent separation (train spacing) requirements in subways, mainline electrification capacity, and train merging through the Oakland WYE. Further, BART's existing central train control supervision computer is limited to the operation of 49 on-line trains (just six more than under current operations). Likewise, the current A-car automatic train control system is unreliable and represents the largest single cause of disrupting service failures on the system.

Completion of fire hardening, KE track, ICS, electrification upgrade, and the Daly City Turnback will allow headways to be reduced 3' 10" by January 1989 (19 trains per hour peak direction) with 52 trains on line. Completion of the Daly City Yard, M-87 Interlocking, New Vehicle ATC, and modifications identified by the System Performance Study, are expected to result in a minimum scheduled headway of 2' 30" by September 1989. Completion of Brake Rate Modifications after FY 1989/90 is expected to result in reducing minimum scheduled headway to 2' 15". In addition to the benefits in terms of capacity are those relating to operational efficiency and flexibility, primarily due to the new C-car design, KE track, and Daly City yard. The C-cars will permit trains to be properly sized while on line, rather than requiring extra time and vehicles for yard sizing as is presently done. The new yard will also permit midday layups in the Westbay, avoiding unnecessary trips to and from existing Eastbay storage

facilities. These projects together are expected to significantly reduce excess car miles (by allowing capacity to be more closely tailored to demand) which will reduce power consumption and maintenance requirements. The KE track will greatly increase operational flexibility in the central section of the system where route merging activity occurs. Largely as a result of these improvements, BART average weekday ridership is expected to increase from 212,000 in FY 1984/85 to 254,000 by FY 1989/90 (this includes the impact of the January 1986 30% fare increase and the 15% fare increase proposed for FY 1988/89).

COMPREHENSIVE MARKETING PROGRAM

Operator Description

BART marketing activities during FY 1985/86 build upon past efforts and continue to focus on increasing offpeak/reverse commute ridership, increasing the number of offsite ticket sales outlets, and improving the availability of passenger information in stations. Downtown San Francisco and Oakland are the primary retail target areas for this effort. The "Shopper's Special" train service on Sundays between Thanksgiving and Christmas which has been provided for the past two years, was operated again this past holiday season. In addition to the "Shopper's Specials", BART conducted a six-month test of extending the service hours on both the Fremont/Daly City and Richmond/Daly City routes approximately one hour beyond the current weekday schedule. This test began on September 9, 1985 meaning that the last direct (no-transfer service) Transbay trains on these two routes departed Richmond and Fremont at approximately 7 PM, with the last direct trains departing downtown San Francisco at approximately 8:30 PM for service back to Richmond and Fremont. A prime objective of this service extension is to attract a minimum of 700 additional trips (primarily related to evening events and shopping in downtown San Francisco) to cover operating expenses.

The second focus of BART's marketing effort is to increase the availability of high value and discount tickets through an expansion of the number of offsite ticket sales outlets. These outlets, as included under the "Tickets-to-Go" program, are in addition to participating banks and savings and loans which also sell BART tickets. An expansion of these latter outlets is also part of this effort.

A third area addressed by BART's comprehensive marketing program is improvement of passenger information in stations. Under joint sponsorship of the Regional Transit Association (RTA) and participating transit agencies, a prototype passenger information center for Oakland City Center/12th Street Station is currently under development. This center will consist of a series of eight specially mounted display cases on the station walls which contain updated maps and information for BART, connecting public transit, and local street maps with points of interest noted. This series of eight information display cases will be mounted in the vicinity of each station agent's booth at 12th Street Station (north, south, and center entrance-way locations). This program is planned for expansion to all designated regional transfer stations at a later date. Based on an evaluation of the first phase prototype at 12th Street Station and the second phase extension to 14 additional stations, the passenger

information concept may be expanded to include the remaining 19 BART stations.

Impact: Short-term.

Objective

To increase BART system utilization and cost-effectiveness through increased offpeak and reverse commute ridership, improved passenger information, and added ticketing convenience.

Performance Indicators

See table on the following page for a summary of performance.

Operator Comments

As seen in the table on the following page, July-December 1986 performance was favorable relative to budget objectives for the same period for all the PIP marketing indicators except "rail passenger revenue/seat mile" (rail revenue for the first half of the year was 2.9% under budget as a result of 2.6% below forecast ridership).

The marketing objectives for the entire 1985/86 fiscal year have been revised relative to those presented in the September 1985 PIP submittal. The new targets presented in the far-right column in the table are consistent with the District budget adopted in October 1985, which includes the impact of the January 1986 30% fare increase.

Most recent data relating to the PIP marketing measures, indicate below budget performance during January and February 1986 with the exception of "average weekday offpeak trips" which is on target. Favorable January-February 1986 performance with respect to rail expense, 2.3% below budget, was not sufficient to offset below forecast total BART ridership (-5.7%) and rail passenger revenue (-10.0%). The variance disparity between total trips and revenue is due to MUNI Fast Pass BART ridership which actually increased in response to higher regular BART ticket fares and a Fast Pass price reduction from \$24 to \$23 starting January 1986. Based on the revenue sharing agreement with MUNI, BART only receives partial earnings for Fast Pass trips. (BART received an average of 25.7¢ per Fast Pass trip during July-December 1985 versus a 60¢ fare*.)

In order to achieve the annual 1985/86 PIP objectives, BART will endeavor to increase offpeak ridership above current levels through more intensified marketing efforts. The fourth quarter presents a good opportunity to achieve this, particularly with the advent of warmer and dryer weather and increased number of major events served by the system including the A's games and Bay-to-Breakers. Because rail revenue and passenger miles are a function of total ridership, however, continued below forecast peak BART patronage could offset any gains made with respect to the offpeak market.

FY 1985/86 PIP STATUS REPORT
COMPREHENSIVE MARKETING PROGRAM

Performance Indicator	BEFORE JANUARY 1986 FARE INCREASE			AFTER FARE INCREASE		FY 1985/86 Adopted Budget & PIP Objective
	FY 1984/85 Actual	Previous ¹ FY 1985/86 Objective	Adopted YTD Budget Jul-Dec 85 Actual	Jan-Feb 86 Actual	Jan-Feb 86 Budget	
Average Weekday Offpeak Trips	106,171	109,600	108,400	98,002	97,200	104,100
Average Saturday Trips	86,474	89,800	85,180	76,029	79,150	84,200
Average Sunday Trips	50,968	51,600	49,650	40,245	44,125	48,400
Rail Operating Cost/Passenger Mile	17.3¢	18.5¢	18.6¢	22.2¢	18.8¢	18.8¢
Rail Farebox Ratio ²	48.4%	43.0%	45.3%	47.5%	51.5%	51.4%
Rail Passenger Revenue/Seat Mile ²	3.0¢	3.3¢	3.1¢	2.9¢ ³	3.3¢ ³	3.5¢
Offsite Ticket Sales Outlets (Number by year end and increment over prior year)	139 (---)	168 (+29)	None (---)	146 (+7)	None (---)	168 (+29)

NOTES:

- Previously identified PIP objectives, per the September 1985 PIP submittal, were based on the draft budget projections contained in the Draft 1985 SRP. Revised PIP objectives appear in the far-right column and are based on the FY 1985/86 adopted budget which includes the impact of the January 1986 fare increase.
- Objectives and actuals have been revised to include only rail component (ie: express bus data have been excluded), consistent with other indicators presented in this table.
- February 1986 car miles are not available. Actual and budget figures are for January 1986 only.

Additionally, BART will continue efforts to achieve its "offsite ticket sales outlet" objective. As of February 1986, 7 new outlets have been added this fiscal year (versus an objective of 29 by June 1986).

The implementation of a prototype passenger information center at 12th Street Station (originally scheduled for completion this fiscal year) has been delayed pending the sign-off by participating agencies on a memorandum of understanding for this RTA sponsored project. Three of the 8 display panels being developed are expected to be installed by July 1986. These panels, which constitute BART's portion of the project, include an updated system map, route diagram map, and station area map. The latter map is to include local bus stop information as well as indicating key points of interest in the vicinity of the station.

APPENDIX C

INTER - OPERATOR
COORDINATION

(To be provided under separate cover)

APPENDIX D

CAPITAL PROJECT
JUSTIFICATION

PROJECT NAME: Daly City Turnback/Yard (11RD/SD)

The Daly City Turnback Project is one of a series of BART projects designed to increase BART's passenger-carrying capacity to meet current and future rider-ship demand. It will permit closer headways during the peak.

Function of Turnback Facility. The purpose of the turnback facility is to provide an area at the end of the M-Line for trains to reverse direction and transfer from an inbound track to an outbound track.

The current time required to turn trains back is determined by the time it takes a train to enter the crossover, move into the platform, offload and load passengers, reverse the controls, obtain a destination from Central and to clear the switching area. Until the outbound train clears the switching area, the following train cannot move into the same platform. This maneuver takes a minimum of 3.50 minutes and an average of 4.25 minutes if operations are sustained beyond one hour. Additionally, only one train can be turned back at a time. During the peak period, the inbound trains are on 3.75 minute headway, which eventually causes a backup.

The Turnback and Yard facility will allow the transfer of the turnback maneuver to an area behind the station. By transferring the turnback maneuvers beyond the station, the station platform would only be occupied when trains load or offload passengers, a process that normally takes 20 seconds or less. Several trains could be on different parts of the turnback tracks at any time, each going through its turnback procedure independent of the other trains. The dispatch from Daly City could then be as frequent as normal train detection will permit, i.e., 135 seconds (2 1/4 mins) under the Sequential Occupancy Release System (SORS). This will permit the system to maintain the outbound schedule even though inbound traffic may be arriving sporadically. For example, if there is a 20 minute delay in inbound traffic, there are sufficient trains in the turnback area behind the station to sustain a normal dispatch schedule. Currently, any inbound delay is reflected in the outbound schedule.

Function of Storage Yard. At present, trains end their revenue service at the Daly City station, are deadheaded (operated without passengers) to the East Bay for storage, and then deadheaded back to Daly City to begin service for the next peak period. The proposed storage yard would allow midday and overnight storage of BART cars for use during the peak period. The yard would also be used to assemble cars into the appropriately sized trains. Additionally, the yard will be designed to allow the interior of the cars to be cleaned while the cars are in the yard.

Based on the System Performance Study results, it is important to keep traffic in the inbound direction from Daly City to a minimum. This is because it will serve to aid in failure recovery if trains can be turned back short of Daly City when there is a failure. The Yard is necessary to accomplish this.

PROJECT NAME: Daly City Shop (11TD)

As part of the review of vehicle maintenance requirements to support 74 train higher capacity service, BART considered the option of building a service and inspection facility at Daly City. Kaiser Engineers Corporation was hired in 1984 to review the requirements and make a recommendation. Their recommendation was that a Service & Inspection facility be added to the Serramonte Yard. The results are based on the following conclusions:

- A. There will be a 34% increase in fleet size and a 15% increase in annual car hours when BART implements 74 train service. There will, however be a 300% increase in failures heading toward Daly City.
- B. Vehicle maintenance workload will increase at least 15% as a result of increased vehicle hours. The current maintenance facilities are at 94% capacity, thus there is at least a 9% shortfall in maintenance capacity. Since it is not wise to design maintenance facilities to operate at capacity (due to problems with peaking), the design should provide at least the same level of efficiency.
- C. Because of problems with deadheading during revenue operations, and the undesirability of running "hospital trains" during nightly track maintenance, it is most efficient to locate the additional shop capacity at Daly City. The Serramonte Yard Shop is estimated to cost \$1.3 million annually more than expansion of the existing east bay yards, however operational considerations make it much less desirable to expand East Bay facilities.
- D. A shop at Daly City should improve vehicle availability over what would occur if the facilities were located in the East Bay. This coupled with fewer disruptions moving cars to perform maintenance, will benefit the passenger through reduced delays and more cars on line.

An Environmental Assessment (NEPA) and Initial Study/Negative Declaration (CEQA) has been prepared. This report will be submitted to the BART Board of Directors and, if approved and adopted, project design and construction can proceed.

PROJECT NAME: Rail Replacement FY 87/88 (15CM)

Due to BART trains traveling up to speeds of 80 mph, with an acceleration rate of 4.4 feet per second operating under a fully automated train control system, it is most important that the track structure be maintained at a level exceeding Federal Railway Administration and other transit systems safety standards. Rail replacement throughout the BART system is, therefore, based on the following criteria:

1. Widening of Gauge on Curves Due to Wear

Curve high-side rails are subjected to wheel wear caused by wheel/rail interface and centrifugal force. The 500' to 1100' radius curves require transposition and rail renewal on a two-year basis. The Oakland Wye and Daly City complex receive four times the wear of other curves in the District as a result of all lines converging at these points. Due to the underground Wye configuration, rail cannot be turned to obtain maximum wear on both field and gauge side and must be scrapped after one transposition upon rail reaching its maximum allowable wear. Rail is transposed when the gauge side is worn 1/2". Allowing wear in excess of 1/2" has the possibility of developing a false rail flange which could lead to derailment. In addition to transposition, BART uses rail lubricators on tight curves to obtain increased rail life. Curves having longer radii with less elevation have a longer life expectancy prior to transposition and may be turned to relay.

Future rail replacement in tight curve areas will be accomplished using Cromo steel to extend rail life.

2. Corrugation

BART has various reasons for rail corrugation, primarily they are: braking, acceleration and wheel slippage on tight curves. BART's automatic train control system causes braking and acceleration to occur at the same locations. Wheel action against the rail during these periods tend to wear and corrugate rail head surface.

Corrugation of inner rail of curves is especially apparent on tight curves. This is attributed to wheel slippage since the solid wheel axle sets, the outside rail wheel must travel further than the inner wheel causing an amount of slippage resulting in corrugation of the inner rail. The frequency of all trucks in a train consist of changing from an accelerating mode to a braking mode causes rail head flat areas or spaced corrugations.

Rail grinding is continuously scheduled to eliminate corrugation and prolong rail life.

3. Fractures and Breaks

When it is determined that a rail is defective due to an internal or external flaw or break, it is necessary to take immediate action to change out the defective rail. In the event of a weld fracture, the rails can frequently be saved by drilling and the placing of rail joint bars to protect the defect.

However, this action depends upon location, rail length and extent of fracture damage. Under certain conditions, rail must be replaced following weld defects.

4. End Batter and Shelling

End batter is the deformation of the surface of the head of the rail in the immediate vicinity of the end. Shelling is the separation of a shell-like piece of metal, usually 3/15" in depth or less, from the parent rail head metal, generally at the gauge corner.

BART trackway is inspected annually using an ultrasonic rail detection car. It detects flaws, fractures, breaks, etc., in the rail. Frequent track geometry car inspections are used to detect wide gauge due to rail wear and other related rail problems. Frequent walking inspections are also made to determine transposition and rail relay programs. Using these combinations of inspection methods ensures rail replacement on a planned scheduled basis eliminating the possibility of in-service rail failures.

BART's philosophy is to replace rail when curve wear reaches the 1/2" factor or it is determined by inspection methods that other defects appear to be developing which eventually will cause the rail to fail in service. This is due to the stringent safety regulatory environment, local emphasis on safety and patron comfort. BART's high quality of track maintenance contributes greatly to on-time performance, to extending revenue car life and ensures patron safety. The current and anticipated long range rail replacement program will continue providing for BART's outstanding patron safety and comfort record.

**PROJECT NAME: Wayside Train Control & System Performance Modifications
(Formerly Wayside ATC Mods and BETSI (20--))**

I. Summary

As a result of the System Performance Study, several modifications to the basic Automatic Train Protection System and other Automatic Train Control Equipment have been identified. They include:

- o Reconfiguration of train detection circuits in the area of the M-Line, the Oakland Wye, the K-Line, and some parts of the A-Line including modifications to SORS.
- o Resignalling of other portions of the M-Line and other selected locations.
- o Installation of station approach markers to allow faster station berthing.
- o Changes to the Central Control computer algorithms.
- o An effort to reduce both the frequency and duration of common delay causing events.
- o Development of enhancements to computer programs used in the design of train control.
- o Revise the brake rate algorithm with which signalling profiles are generated.

II. Detail

This project, which is the result of the System Performance Study, provides for the upgrades necessary to Wayside Automatic Train Control (ATC) to reach 2-minute 15-second headways. It is made up of several tasks or subprojects as described below:

1. Reconfiguration

BART Wayside train protection (collision avoidance) depends principally on the Automatic Train Protection System. This system basically detects the presence of trains and sends signals to control the speed of following trains. To do this, the system divides the running rails up into a series of sections called "blocks." Shunts connect the rails in each block and allow an electric circuit to be established.

Each track circuit is used for two purposes. First, speed commands (after called speed codes) are sent to the trains along the rails in each block. The speed codes are derived from information about the location of other trains, switch positions, and civil speed limits. Each train is continually being sent speed codes commanding it to move at a particular speed or stop depending upon the circumstances. The

second purpose of the track circuit is to serve as a means for detecting train presence in a block. The train wheels and axles short the tracks in a block causing the Automatic Train Protection System to detect the train.

It is this train detection function which has caused problems with BART's train control. In some very rare cases, trains or cars may not be detected. If a train is not detected, there is the possibility that a zero speed code (stopping signal) may not be sent to a following train in time for it to stop.

To remedy the situation, a backup system called Sequential Occupancy Release (SOR) has been installed. This system is a set of computers, generally two per train control room (often called stations since they are located in the stations), which follow movements as trains move through the system. The computer is programmed to "expect" sequential occupancy and deoccupancy of blocks. As the train progresses, the SOR System sequentially latches an occupancy and then releases it as the next block in the sequence indicates an occupancy. When a train fails to be detected, the sequential pattern is broken and the computer causes the latched occupancy to be maintained in the block where the train was last detected. The latch remains until the error is corrected and the computer is reset.

In areas of dense traffic (closely spaced trains) the SOR System and the original long block lengths of the Automatic Train Protection System have been shown by the System Performance Study to limit the distance between trains. The study also showed that this limitation can be reduced greatly by shortening the block lengths in these areas.

This subproject consists of the addition and relocation of track shunts to provide track circuits of approximately 350 or 700 feet lengths in the areas of signalling and SORS constraint. Changes are needed in the M-Line and some changes will also be made in the Oakland Wye, on the K-Line, and a short portion of the A-Line.

2. Resignalling

As discussed in the description of the Reconfiguration subtask, each train receives speed codes which tell it how fast to proceed. These speed codes are derived from information about locations of other trains, as well as civil speed limits. They depend upon the block lengths and upon the brake rate that the train is expected to follow. A major part of the reconfiguration subtask will include resignalling in the modified areas. This subtask will resignal the remainder and other selected area to optimize throughput.

3. Station Approach Markers

The current BART design requires that all trains approach every station at a particular speed in order for the train to berth quickly and stop at the proper place in the station. This is due to the design of the "program stop" function in the onboard Automatic Train Control equipment. In many situations, it would be desirable to have trains

approach the station while maintaining higher rate of speed. The optimum location for beginning the program stop is different for each station.

The new onboard Automatic Train Control is being designed so that start of the station berthing (stopping profile) may begin upon receipt of a signal from a marker antenna placed at the optimum distance ahead of the station. This subtask would install those antennae.

4. SOR Software

This subproject will cover all revisions to the SORS computer data base and programming to accommodate changes in track circuits, etc.

5. ICS Enhancement

The Integrated Control System (ICS) will replace the existing Central Train Control Computer with new hardware, software, and data transmission systems. The Central computer handles overall system coordination and supervision tasks. The improvement is necessary to allow central supervision of more than about 50 trains. It will also improve the methods and capabilities of Central Train Control. However, the System Performance Study has identified improvements in Central computer regulation and control needed for closer headways that were not included in the basic ICS plan. These include such controls as metering trains into merges (i.e. the Wye) and smoothing train flow in congested locations.

6. Delay Reduction Preliminary Design

Close headways will require the reduction of both frequency and duration of common delays of trains. To maintain the same quality of service at the close headways, delays of one to five minutes will be significant, as well as those of longer duration (over 5 minutes). This task will evaluate the actual occurrence and cause of delays of 1 to 5 minutes, and the sensitivity of the system to those delays. The results will be a design that will provide the basis for an amendment or follow on grant application to accomplish the improvements.

7. Simulation

The RTS simulator computer program and the auxiliary programs constitute the tools by which the preliminary engineering for the train control signalling and BART operations improvements can be evaluated and specified. The programs developed for the S.P.S. have served the purpose well and enabled the study to determine the feasible improvements to achieve the BART service goals. However, in the use of the programs, it became evident that additional tools and program additions are necessary for efficient use in the reconfiguration and other train control projects. This task will accomplish these program additions.

8. Brake Rate Algorithm Revision

To achieve the ultimate headways goal of 2 1/4 minutes will require some degree of relief from the stringent margins of the brake rate signalling algorithm. Since there are four possible elements of the algorithm, together with several possible alternative implementation methods, analysis will be required to select the desired approaches. Brake rate testing of trains at the problem locations will be proposed, and the rationale and data to assure safety must be developed. A risk analysis of the system, with emphasis on the problem locations is anticipated.

With the data and analysis to determine that BART safety will not be compromised, the chosen modifications to the signalling algorithm will be presented to the P.U.C.

PROJECT NAME: Maintenance/Service Vehicles & Equipment (79B-, 79--)

Maintenance/Service Vehicles:

As BART's support vehicle fleet ages, older vehicles reach the age and mileage where they are no longer economical to maintain and/or repair. At this point, it is more cost effective to replace these vehicles than continuing to repair them.

BART has a fleet of light-duty highway vehicles to transport personnel and necessary equipment to work sites in the District. In addition, BART police and District personnel use sedans for regular duties. These vehicles are selected for replacement according to a consistent procedure developed by BART staff. Generally, the policy requires that sedans and pickups must be replaced after 70,000 miles and vans and police cars after 90,000 miles. At current usage rates, an average of 40 light-duty vehicles must be replaced each year. On the average, this is equivalent to replacing each vehicle every five years. However, heavily used vehicles are replaced more often while lightly used vehicles are replaced less often.

Heavy-duty maintenance vehicles also need periodic replacement. Maintenance personnel use these vehicles, which include diesel trucks, tractors, and track-maintenance vehicles, to repair and maintain BART's physical plant and to respond to emergencies. These vehicles' costs and useful lives vary widely.

Maintenance Equipment:

BART's maintenance equipment gradually becomes worn from age and usage. Eventually it becomes more economical to replace the old equipment rather than repair it. The ongoing equipment replacement program assures that old, worn-out equipment is replaced in a timely manner to minimize overall costs and ensure personnel safety. If this equipment is not replaced, overall costs will increase and maintenance crews will be disrupted by failed equipment.

This maintenance equipment includes such items as electric and pneumatic grinders and hand tools, portable light and power generator sets, light towers, air compressors, electric carts for transporting personnel and material, commercial lawnmowers and ground maintenance equipment. Vacuums, floor

scrubbers, polishers and various floor maintenance equipment. Shop equipment such as jacks, jack stands, saws, drills, engine test equipment. Electric and electronic meters, gauges, test instruments and equipment.

PROJECT NAME: New Maintenance/Service Vehicles (79A-)

New Vans & New Pickups:

In preparation for service increments to be allowed by the Capacity Expansion Program, BART will need to increase the size of the service vehicle support fleet. This project will purchase two (2) fully-equipped vans in support of Wayside Train Control Maintenance crews, and purchase one new 3/4 ton pick-up truck in support of escalator/elevator crew, Daly City Yard and Shop mechanics.

New Hi-Railers:

The increase in BART service, resulting in additional transit vehicles and additional trains running at closer headways will have an impact on present track structure maintenance programs and repair. To insure that the level of maintenance exceeds the Federal Railway Administration requirements, the track maintenance cycles relating to surfacing, lining and tamping have to be modified, calling for additional manpower and equipment.

To meet this goal, a hi-rail crew truck, complete with crewcab, to transport personnel, 120 CFM air compressor, 10KW generator set and tool and equipment storage compartments will be required to support and dedicated to the crew responsible for track maintenance.

The increase in service as stated above holds true for structure maintenance as related to the transbay tube, tunnels, and all underground track areas. The frequency of maintenance related to water control, washing, corrosion, bolt torquing, and caulking the steel-liner plates will have to be modified.

To meet these goals, an additional hi-rail truck, especially designed for tunnel maintenance will be required. This unit will be complete with an elevating work platform, 120 CFM air compressor, 10KW generator set and crew cab for transporting personnel.

The recent expansion of the KE Line, the present expansion at Daly City, and the electrification upgrade on the "C" Line, all result in additional equipment, i.e., substations gap breaker station, third rail and third rail cover-board that requires cycled maintenance and repairs. To meet District maintenance goals, additional manpower and equipment will be required. A hi-rail truck complete with elevated platform and service body for transporting specialized tools and materials will be essential.

PROJECT NAME: Transportation Buildings Expansion (01RM, 03PH, 05NF)

Presently (1985), there are approximately 230 train operators at BART. Once the Capacity Expansion Program is complete, approximately 75 additional operators will be required to provide 74 train service. These additional people will necessitate the addition of lockers and restroom facilities at all three East Bay Yards. In addition, breakrooms need to be expanded to allow for the additional people. Current facilities are overcrowded with some lockers being placed in restroom areas as a means of accommodating the overload. This project would relieve the current overcrowding while providing facilities to support higher density service.

PROJECT NAME: Pleasant Hill Station Parking Facility (03N-)

This project involves development of a 1200-space, multi-level parking facility. All 1,652 currently available BART parking spaces are filled by 7:00 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$1,024,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 350 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 2,025 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Station Essential Power (20HB)

Certain BART train control and communications equipment is supplied by essential power systems. These systems provide uninterruptible power during station power outages and isolate the supplied equipment from utility power system transient disturbances. Currently, uninterruptible power systems (UPS) furnish this essential power.

New projects such as the Integrated Control System (ICS) and Communications Cable Network (CCN) are underway. Some functions which are presently supplied

by essential power may be replaced, but total requirement will be about two times the existing essential power supply capacity.

The objective of this project is to provide essential power capacity for existing critical systems and new systems such as ICS, CCN, and the enhancement of the Radio Communications (RADCOM).

The scope of this project is to provide for design, furnishing, and installation of equipment and batteries to upgrade the essential power systems in the train control rooms of 32 stations, 3 yards, 3 ventilation structures and 1 portal structure for new and existing systems. The work will be implemented by a furnish and install, competitively bid, contract and cutover assistance by BART maintenance forces.

Essential power upgrade must be completed before the ICS is used to control revenue operation.

PROJECT NAME: Parking Lot Productivity Improvement Program (0--K)

This project is part of a continuing program to increase parking capacity at various stations. Basically, parking will be restriped with narrower and shorter stalls, as well as reduced access lane size.

The existing lots at the following stations are planned for redesigned, resulting in approximately 2120 new parking spaces: Fruitvale, Lafayette, El Cerrito Plaza, Orinda, Hayward, Fremont, San Leandro, Ashby, North Berkeley, Coliseum, and Richmond.

BART has obtained city concurrence from the City of Oakland to redesign Fruitvale Station. BART will seek concurrence by the appropriate jurisdiction for the other stations prior to beginning construction.

BART has projected that there will be a total shortage of 3938 parking spaces at these stations when the Capacity Expansion Program is completed. This Parking Lot Productivity Improvement Project is the quickest and most cost effective method of alleviating some of the projected parking deficiency.

PROJECT NAME: Embarcadero Stairway Expansion (11FG)

As a result of the 1979 fire in the Transbay Tube, BART embarked upon a program to improve the fire resistance of the BART vehicle, evaluate evacuation times, and evaluate wayside emergency response equipment. A number of improvements resulted from that effort, as well as several recommendations. In regards to this project, a Gage-Babcock (consultant) study recommended additional exiting facilities for certain BART stations. BART's safety evaluation concluded that exiting from the Embarcadero Station should be improved. This project would provide modification of the Embarcadero Station to bring emergency egress time within the mean for underground stations.

PROJECT NAME: System Safety Upgrade (99*15)

In 1980, BART retained Gage-Babcock Associates (GBA) to study existing emergency wayside facilities. The District is in the process of implementing a number of these projects individually identified in the Project Status Report.

In February 1985, the Commission instituted OIL 85-02-007 to determine if BART should be ordered to implement additional wayside modifications. It is anticipated that the Commission may, in fact, order BART to proceed with some additional modifications. The cost may exceed \$5,000,000 depending on the action of the CPUC.

PROJECT NAME: Lafayette Surface Parking Lot (03JE)

All 1,100 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$264,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak, as well as off-peak periods.

Over 150 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 555 spaces. The problem has been accentuated by the implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: El Cerrito del Norte Surface Parking Lot (05K-)

All 2,000 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$374,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 75 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 1,115 spaces. The problem has been accentuated by the implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Concord Surface Parking Lot Expansion (03S-)

All 2,000 currently available BART parking spaces are filled by 7:00 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$1,050,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

The BART patron parking shortage projected for 1988 is 2,200 spaces. The problem has been accentuated by the implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Oakland West Surface Lot Expansion (11E-)

All 403 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$529,000 per year in 1983 (latest figures available). This loss will increase significantly under the

newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 400 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 1,830 spaces. The problem has been accentuated by the implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: No. Berkeley Surface Parking Lot Expansion (05GB)

All 524 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$70,000 per year in 1983. (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 50 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 190 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: So. Hayward Surface Parking Lot Expansion (01QF)

All 1,000 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$258,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 200 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 615 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Bayfair Surface Parking Lot Expansion (01M-)

All 1,150 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$327,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 30 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 810 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or

other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Hayward Surface Parking Lot (01Q-)

All 967 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$247,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 275 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 650 spaces. The problem has been accentuated by the implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Union City Surface Parking Lot Expansion (01VG)

All 1,166 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$247,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 260 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 560 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Alameda Park/Ride Facility (01G-)

All 790 currently available BART parking spaces at Fruitvale are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$327,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 150 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 1,050 spaces. The problem may be accentuated by the possible implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to this facility will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Dublin Park/Ride Facility (08GA)

All parking spaces at the two stations most heavily utilized by Livermore/Amador Valley residents are filled by 7:30 a.m. This lack of accessibility results in diversion of potential patronage to other transportation modes, principally automobiles. Such diversion deprives BART of potential revenue which could be realized by filling available Express Bus and rail capacity.

BART lost \$574,000 in potential net revenue at Hayward and Bayfair alone in 1983 (latest figures available). This loss of potential revenue will grow as the BART capacity increase program is implemented.

BART is currently streamlining Express Bus operations to more closely approximate the level of service offered on BART rail lines, i.e. fewer stops and faster trip times. One consequence of this effort is that local neighborhood on-street accessibility will decrease in favor of a limited number of access points oriented to the freeway system.

Although BART anticipates a significant level of local transit operator service to these centralized Express Bus access points, the fact that they will be located in low density suburban settings suggests strongly that parking facilities will be required as well.

PROJECT NAME: W. Livermore Park/Ride Facility (08KA)

All parking spaces at the two stations most heavily utilized by Livermore/Amador Valley residents are filled by 7:30 a.m. This lack of accessibility results in diversion of potential patronage to other transportation modes, principally automobiles. Such diversion deprives BART of potential revenue which could be realized by filling available Express Bus and rail capacity. BART lost \$574,000 in potential net revenue at Hayward and Bayfair alone in 1983 (latest figures available). This loss of potential revenue will grow as the BART capacity increase program is implemented.

BART is currently streamlining Express Bus operations to more closely approximate the level of service offered on BART rail lines, i.e. fewer stops and faster trip times. One consequence of this effort is that local neighborhood on-street accessibility will decrease in favor of a limited number of access points oriented to the freeway system.

Although BART anticipates a significant level of local transit operator service to these centralized Express Bus access points, the fact that they will be located in low density suburban settings suggests strongly that parking facilities will be required as well.

PROJECT NAME: Hercules Park/Ride Facility (06KA&)

All parking spaces at the El Cerrito del Norte station (most heavily utilized by Northwest Contra Costa and Solano County residents) are filled by 7:30 a.m. This lack of accessibility results in diversion of potential patronage to other transportation modes, principally automobiles. Such diversion deprives BART of potential revenue which could be realized by filling available Express Bus and rail capacity. BART lost \$374,000 in potential net revenue at del Norte alone in 1983 (latest figures available). This loss of potential revenue will grow as the BART capacity increase program is implemented.

BART is currently streamlining Express Bus operations to more closely approximate the level of service offered on BART rail lines, i.e. fewer stops and faster trip times. One consequence of this effort is that local neighborhood on-street accessibility will decrease in favor of a limited number of access points oriented to the freeway system.

Although BART anticipates a significant level of local transit operator service to these centralized Express Bus access points, the fact that they will be located in low density suburban settings suggests strongly that parking facilities will be required as well.

PROJECT NAME: Railroad Avenue Park/Ride Facility (04IA)

All parking spaces at the Concord station (most heavily utilized by East County residents) are filled by 7:00 a.m. This lack of accessibility results in diversion of potential patronage to other transportation modes, principally automobiles. Such diversion deprives BART of potential revenue which could be realized by filling available Express Bus and rail capacity. BART lost \$1,050,000 in potential net revenue at Concord alone in 1983 (latest figures available). This loss of potential revenue will grow as the BART capacity increase program is implemented.

BART is currently streamlining Express Bus operations to more closely approximate the level of service offered on BART rail lines, i.e. fewer stops and faster trip times. One consequence of this effort is that local neighborhood on-street accessibility will decrease in favor of a limited number of access points oriented to the freeway system.

Although BART anticipates a significant level of local transit operator service to these centralized Express Bus access points, the fact that they will be located in low density suburban settings suggests strongly that parking facilities will be required as well.

PROJECT NAME: Grimmer Blvd. Park/Ride Facility (02GA)

All parking spaces at the Fremont station (most heavily utilized by South County and Santa Clara County residents) are filled by 7:00 a.m. This lack of accessibility results in diversion of potential patronage to other transportation modes, principally automobiles. Such diversion deprives BART of potential revenue which could be realized by filling available Express Bus and rail capacity. BART lost \$199,000 in potential net revenue at Fremont alone in 1983 (latest figures available). This loss of potential revenue will grow as the BART capacity increase program is implemented.

BART is currently streamlining Express Bus operations to more closely approximate the level of service offered on BART rail lines, i.e. fewer stops and faster trip times. One consequence of this effort is that local neighborhood on-street accessibility will decrease in favor of a limited number of access points oriented to the freeway system.

Although BART anticipates a significant level of local transit operator service to these centralized Express Bus access points, the fact that they will be located in low density suburban settings suggests strongly that parking facilities will be required as well.

PROJECT NAME: El Cerrito del Norte Parking Facility (05KH)

All 2,000 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$374,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 75 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 1,115 spaces. The problem has been accentuated by the implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Oakland West Parking Facility (11E-)

All 403 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$529,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 600 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 2,430 spaces. The problem will be accentuated by the impending implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Lafayette Parking Facility (03JG)

All 1,100 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$264,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 150 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 555 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Walnut Creek Parking Facility (03LG)

All 1,263 currently available BART parking spaces are filled by 7:00 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$517,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 650 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 1,080 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Fruitvale Parking Facility (01G-)

All 790 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$327,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 150 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 1,050 spaces. The problem may be accentuated by the possible implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Concord Parking Facility (03SH)

All 2,000 currently available BART parking spaces are filled by 7:00 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$1,050,000 per year in 1983 (latest figures available). This loss will increase significantly under

the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

The BART patron parking shortage projected for 1988 is 2,200 spaces. The problem has been accentuated by the implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Bayfair Parking Facility (01MH)

All 1,500 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$327,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 30 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 810 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Orinda Parking Facility (03HG)

All 1,100 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$226,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 20 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 485 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Lake Merritt Parking Facility (01EE)

All 190 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$128,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 100 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 360 spaces.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: MacArthur Parking Facility (07GH)

All 585 currently available BART parking spaces are filled by 7:30 a.m., limiting midday station accessibility when rail capacity is available. Potential net revenue lost due to this inaccessibility was \$236,000 per year in 1983 (latest figures available). This loss will increase significantly under the newly-implemented fare structure. Loss of revenue potential will increase further upon completion of BART's capacity increase program, as rail capacity will become available during peak as well as off-peak periods.

Over 125 patron cars parked on nearby streets in 1983, displacing parking for local residents and businesses. The BART patron parking shortage projected for 1988 is 750 spaces. The problem will be accentuated by the impending implementation of station area parking restrictions on non-resident parking.

Additional parking will be necessary to optimize rail efficiency even if the access mode shares supplied by bus transit and carpools remains constant or even increases. Recent experience and projected patronage growth indicates substantially higher absolute numbers of patrons arriving at the station by all modes, including autos.

BART anticipates that most of the autos attracted to new parking will be drawn from regional commuters now utilizing freeways and other congested arteries for their entire commute, and not from current BART patrons now using buses or other access modes. This parking project would therefore remove the major portion of each of these regional trips from the highways, including some of the most severely congested segments in the Bay Area.

Finally, additional parking would allow BART to provide more parking for handicapped patrons and carpools.

PROJECT NAME: Phase IV Accessibility Improvements - Handicapped (15N-)

This project provides for continuing modifications to make BART more accessible to the handicapped patron.

PROJECT NAME: Aerial Sound Barriers - Albany Elevated Track (99*05)

Residents along elevated track in Albany have complained of noise from BART. The City of Albany filed a lawsuit to get BART to install measures to reduce the noise. This project would allow that installation.

PROJECT NAME: Regional Emergency Training Program (99*80)

Will allow development of an emergency response training program to be used by BART to train BART, fire department, police, and other personnel involved in responding to emergencies.

PROJECT NAME: Pittsburg-Antioch Extn Studies (04AC)

The Pittsburg-Antioch Corridor has experienced a substantial population growth in recent years. Affordable housing and a shortage of job opportunities in the East Contra Costa County area (Pittsburg, Antioch and Brentwood) coupled with substantial new job creation in Central Contra Costa County, Alameda, and San Francisco Counties has resulted in increased commuting from East County to these employment centers. These growth trends are projected to continue. In addition, congestion makes access to the downtown Concord BART Station from Martinez, North Concord, and the East County area difficult.

Recognizing the need for transportation improvements in the corridor several transportation alternatives and alternative routes have been investigated. These studies have addressed major transportation improvements including BART, LRT, Express Bus, highway improvements and local bus improvements. An Alternatives Analysis/DEIS/DEIR is needed to select a locally preferred alternative to resolve these problems. The AA/EIS is expected to begin in the winter of 1985/86.

Footnote:

- * As environmental documentation for new starts and extensions are considered part of "New Starts", they do not go through the TIP process, but are considered through the resolution process. MTC Resolution No. 1558 dated September 27, 1985 authorized the MTC Executive Director to apply for UMTA Section 9 funds for the Pittsburg-Antioch Extension AA/EIS.

PROJECT NAME: Fremont/South Bay Fremont Extn Studies (02AC)

The systems level analysis for the Fremont to South Bay Corridor considered 31 possible improvement strategies in a (Phase I) final report completed in January, 1985. The Technical and Policy Advisory Committees evaluated report results and selected nine alternatives for further detailed study in a (Phase II) AA and DEIS. The following approved "short list" of nine alternatives include two pure BART alternatives and three BART/LRT composite alternatives:

- ° Alternative 1 - No build (Existing and programmed improvements)
- ° Alternative 2 - TSM (General low-cost highway and transit improvements)
- ° Alternative 3 - Express bus (Fremont to San Jose region)
- ° Alternative 5C/D - LRT (Fremont South to Tasman, then west to Sunnyvale/Mountain View or Lawrence Expressway)

- ° Alternative 6A/B - BART (Fremont to downtown San Jose via SP or WP Rail Corridors)
- ° Alternative 6D/E - BART (Fremont south to Tasman or Route 237; then west to Sunnyvale/Mountain View)
- ° Alternative 7A(1) - BART/LRT (BART to Mission/Warm Springs; LRT to Sunnyvale/Mountain View)
- ° Alternative 7A(2) - BART/LRT (BART to County Line; LRT to Sunnyvale/Mountain View)
- ° Alternative 7B - BART/LRT (BART to Milpitas; LRT to Sunnyvale/Mountain View)

The AA/EIS is expected to begin in the winter of 1985/86.

Footnote:

- * As environmental documentation for new starts and extensions is considered part of "New Starts", it does not go through the TIP process, but is instead considered through the resolution process. MTC Resolution No. 1558 dated September 27, 1985 authorized the MTC Executive Director to apply for UMTA Section 9 funds for the Fremont-South Bay AA/EIS.

PROJECT NAME: Livermore/Pleasanton Extn Studies (08AB)

Systems level analysis for this extension was initially completed in 1976 in the Livermore-Pleasanton BART Extension Study. In December 1984, an Update Analysis was completed to reevaluate specific portions of the 1976 route alignment. Subsequent to the completion of the Update Analysis, the BART Board of Directors adopted a portion of a preferred alignment. A Supplemental Analysis to this 1984 study is currently being conducted. The purpose of this study, scheduled for completion in January 1986, is to assist the BART Board of Directors in completing the adoption of a preferred LPX alignment.

The BART Board Extension Staging Policy supports a future BART extension to Castro Valley, Dublin, Pleasanton, and Livermore. The BART Phase I extension to Castro Valley and Dublin is also endorsed in the MTC New Rail Starts and Extensions Resolution No. 1367.

Footnote:

- * As extensions are considered "New Starts", they do not go through the TIP process, but are instead considered through the resolution process. MTC Resolution No. 1367 dated February 22, 1984 includes a two station extension from the existing Bay Fair BART Station to Castro Valley and Dublin.

PROJECT NAME: San Francisco Airport Extn Studies (12AB)

BART has participated in the Peninsula Mass Transit Study required by Senate Resolution #74 which studied alternative rail improvements on the Peninsula, including a BART extension to the San Francisco Airport. The study was completed in June 1985 with the final outcome being a series of recommendations to the State Legislature. Because of continued controversy, an Alternative Analysis on the Peninsula will not be pursued at this time. However, the recommended JPA agency is designated to continue alternative analysis work for the Peninsula Corridor.

Phase I of the BART Board Extension Staging Policy supports a future BART extension to the San Francisco Airport, which is also endorsed in the MTC New Rail Starts and Extensions Resolution No. 1367.

Footnote:

- * As environmental documentation for new starts and extensions is considered part of "New Starts", it does not go through the TIP process, but is instead considered through the resolution process. MTC Resolution No. 1367 dated February 22, 1984 includes a one station BART extension from Daly City to the San Francisco Airport Corridor.

PROJECT NAME: Extension R-O-W Acquisition (0-B-&)

Expenditures on critical rights-of-way and facilities are deemed necessary to ensure that viable route alignments remain available for rail extensions pending funding for construction.

Footnote:

- * As right-of-way acquisitions for extensions are considered "New Starts", they do not go through the TIP process, but are instead considered through the resolution process. MTC Resolution No. 1367 dated February 22, 1984 includes rights-of-way acquisitions in the areas requested in this worksheet.

PROJECT NAME: Pittsburg-Antioch Extension (04AC)

The Concord-Pittsburg-Antioch Corridor has experienced a substantial population growth in recent years. Affordable housing and a shortage of job opportunities in the East Contra Costa County area (Pittsburg, Antioch and Brentwood) coupled with substantial new job creation in Central Contra Costa County, Alameda, and San Francisco Counties has resulted in increased commuting from East County to these employment centers. These growth trends are projected to continue. In addition, congestion makes access to the downtown Concord BART Station from Martinez, North Concord, and the East County area difficult.

Recognizing the need for transportation improvements in the corridor, the BART Board adopted its Extension Staging Policy which specifies in Phase I a 7.5-mile preferred alignment for a future BART extension with proposed stations located at North Concord/Martinez and West Pittsburg. This priority one BART extension, which is also endorsed in the MTC New Rail Starts and Extensions Resolution No. 1367, would address the following service needs:

- 1) Provide mobility.
- 2) Reduce potential auto usage.
- 3) Provide major stimulus for redevelopment of West Pittsburg and to a lesser degree Pittsburg and Antioch.
- 4) Attract new industrial and commercial growth.
- 5) Improve environmental quality.

Average daily patronage on this extension is expected to be 36,200 passengers. The fare box ratio is estimated to be 135%. To the extent the ratio is above the fare box ratio for the basic system, the project will improve efficiency.

Footnote:

- * As extensions are considered "New Starts", they do not go through the TIP process, but instead are considered through the resolution process. MTC Resolution No. 1367 dated 2/22/84 includes a two station extension from the existing Concord BART Station to North Concord/Martinez and West Pittsburg.

PROJECT NAME: Irvington/Warm Springs Extension (02AC)

BART Board Extension Policy specifies a 5.7-mile preferred alignment for a future BART extension to the Warm Springs District of Fremont. This priority extension is the main link for several proposed transit alternatives approved for detailed evaluation in an AA and DEIS for the Fremont to South Bay Corridor Study. The AA and DEIS is expected to begin after MTC's New Rail Starts and Extensions hearings fall/winter 1985.

This extension is expected to have 12,000 patrons on an average weekday. The fare box ratio is estimated to be 93%. To the extent the ratio is above the ratio of the basic BART system, the project would improve efficiency.

Footnote:

- * As extensions are considered "New Starts", they do not go through the TIP process, but instead are considered through the resolution process. MTC Resolution No. 1367 dated February 22, 1984 includes a two station extension from the existing Fremont BART Station to Irvington and Warm Springs.

PROJECT NAME: Castro Valley/Dublin Extension (08AB)

The "BART Extension Staging" policy, adopted September 1983, identifies this as a Phase I Extension. In FY 1983/84, the Metropolitan Transportation Commission adopted a New Starts and Extensions Program which supports this project in its 16-year program.

Local support to date for this extension includes:

- o BART acquisition of a 9.72-acre Castro Valley station site in 1983.
- o CALTRANS provision of an 80-foot BART median along I-580 from SR-238 to the I-580/I-680 interchange.
- o On November 4, 1985, the electorate of the Dublin, Castro Valley, Pleasanton and Livermore passed Measure Q by 41,189 to 11,476. Measure Q reads, "Should BART continue planning for a proposed Livermore-Pleasanton rail extension via Dublin, I-580, and Castro Valley: or should planning for future BART service to Eastern Alameda County instead be confined to an expanded bus operation?"

The Livermore-Pleasanton Extension is expected to have an average daily patronage of 30,000 with a fare box ratio of 46%. This project represents the first two stations on the extension. To the extent the fare box ratio is above BART's basic system fare box ratio, it will improve efficiency.

Footnote:

- * As extensions are considered "New Starts", they do not go through the TIP process, but are instead considered through the resolution process. MTC Resolution No. 1367 dated February 22, 1984 includes a two station extension from the existing Bay Fair BART Station to Castro Valley and Dublin.

PROJECT NAME: San Francisco Airport Extension (12AB)

BART has participated in the Peninsula Mass Transit Study required by Senate Resolution #74 which studied alternative rail improvements on the Peninsula, including a BART extension to the San Francisco Airport. The study was completed in June 1985 with the final outcome being a series of recommendations to the State Legislature. The recommended Joint Powers Agreement would provide for continued rail planning to include an Alternatives Analysis/Environmental Impact Statement for the Peninsula Corridor.

Phase I of the BART Board Extension Staging policy supports a future BART extension to the San Francisco Airport, which is also endorsed in the MTC New Rail Starts and Extensions Resolution No. 1367.

The proposed extension is expected to draw 26,300 patrons on an average week day. The fare box ratio is estimated at 96%. To the extent this is above BART's overall system ratio it will improve efficiency.

Footnote:

- * As extensions are considered "New Starts", they do not go through the TIP process, but are instead considered through the resolution process. MTC Resolution No. 1367 dated February 22, 1984 includes a one station BART extension from Daly City to the San Francisco Airport Corridor.

A P P E N D I X E

B A R T P R I V A T I Z A T I O N P R O G R A M



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PRIVATE SECTOR INVOLVEMENT BAY AREA RAPID TRANSIT

Prepared in Support of BART's FY 85/86 UMTA Section 9 Grant Application

UMTA Guidance on documentation of private enterprise participation in urban mass transportation programs, published January 24, 1986, requires additional documentation from grant recipients in order to qualify for fiscal year 1985/86 grant monies. This document provides a history of past BART efforts relative to private sector involvement. It also outlines future work designed to enhance current compliance in this area.

The material is presented in a format that follows Section II "Review of Grant Applications" of the guidelines. The specific paragraph which is being addressed is cited first, followed by a summary of BART past efforts relative to the paragraph. Following the recitals of BART's past efforts there is a section of this document outlining future BART plans in the area of private enterprise participation.

I. BART Current Efforts

Notice Section II.A.1

"Specific steps in the past 12 months to involve the private sector in early development of services and operations."

BART fixed route rail service does not lend itself to private sector service contracting. BART does contract significant maintenance activity where feasible. Normally contractors are contacted early in the process to assure there is a competitive process in bidding this type of work.

BART Express Bus and shuttle planning process has included coordination with private sector shuttle services being provided by Bishop Ranch in San Ramon, Hacienda Business Park in Pleasanton, Harbor Bay Isle Office Park in Alameda, and private shuttle contractors as outlined under Notice Section III.C.1.

Notice Section II.A.2

"Comments and proposals from private sector relevant to provision of services."

Relative to shuttle services, employers at the Bishop Ranch development in San Ramon asked BART to supplement their private sector shuttle with regular Express Bus service. BART has agreed to do this in March, 1986 with the DX1 route running via Bishop Ranch between Walnut Creek BART and Dublin.

Hacienda Business Park in Pleasanton has asked BART to supplement their shuttle service with regular Express Bus service from the north (Walnut Creek BART) and reduce our service from the west (Bayfair BART) since this

route runs parallel with Hacienda shuttle service. BART staff has agreed to do this by proposing a new DX route to serve Hacienda Business Park from the north (Walnut Creek BART) and curtailing UP Express service from Bayfair BART which competes with the private sector Hacienda shuttle.

Harbor Bay Isle office park in Alameda has asked BART to establish a bus stop location at the Coliseum BART Station and design a special bus stop sign at this location for their shuttle bus. BART has provided a special stop location for the Harbor Bay shuttle and paid for and installed a sign for this private shuttle stop at the Coliseum BART Station.

Notice Section II.A.3

"Information to Private Sector on opportunities for participation."

BART has conducted coordination meetings with Bishop Ranch Hacienda Business Park, and Harbor Bay Isle office park regarding their private sector shuttle services.

In addition, major providers in the region are notified directly of all of BART's UMTA grant applications and provided an opportunity to comment at the required public hearing.

Notice Section II.A.4

"Impediments to contracting out."

BART Board Policy requires that buses are lift-equipped. No private Bay Area bus service providers have enough lift-equipped buses to provide adequate levels of service required by BART on our five route Express Bus system.

Measures to resolve this impediment will be explored in the study outlined in the next section.

Notice Section II.A.5

"Specific steps over next year to involve the private sector in the early development of services and operation."

BART staff will conduct a study and work with MTC to inventory all possible transit service providers in our region noting location of operating base, bus availability, and number of vehicles. This inventory will include consideration of procedures to involve these transit providers during the early stages of our planning process.

In addition, future work to study private sector participation is outlined in the next section of this document.

Notice Section II.A.6

"Private sector complaints."

No complaints.

Notice Section II.B.1

"New and restructured services developed over the last 12 months."

New or revamped services have been restricted in the past 12 months to the Express Bus services.

Reorientation of south corridor Express Bus service which involved:

- rerouting of UP route to serve Hacienda Business Park in Pleasanton
- development of new all day UL service between Livermore and Bayfair BART
- headway changes from 30 minutes to 60 minutes on the basic U route between Livermore and Hayward BART
- reorientation of the East Corridor Express Bus service to provide more direct service and improved headways between Highway Four Corridor park/ride lots and Concord BART
- reorientated Central Corridor service between Walnut Creek BART Station and the San Ramon Corridor.

Notice Section II.B.2

"Assessment of whether private operators could participate through competitive procurement."

No assessment in the past 12 months relative to Express Bus. No federal funds are involved in funding the service.

Notice Section II.B.3

"Methods of proposal evaluation."

No proposals received or methodology established.

Notice Section II.B.4

"Actions planned during next year to give private operators competitive procurement opportunities."

A study is planned to assess the feasibility of developing request for proposals from private bus operators for all new or changed shuttle, Express Bus and feeder bus services. Emphasis in this study will be placed on an evaluation of private sector's ability to operate bus services currently being provided by the public sector. See next section for a broader outline of these study efforts.

Notice Section III.C.1

"Has competitive procurement of existing services or operations been examined during past year."

Competitive procurement of existing Express Bus and shuttle services has not been examined in detail during the past 12 months. However, in the past BART has instituted the following privately operated shuttles:

LOMA RANGER SHUTTLE

In April 1980, the Planning Division developed a shuttle service demonstration from the Glen Park BART Station through the Miraloma Heights neighborhood. A request for proposals to operate this shuttle service was distributed to fifteen private sector providers in May of 1980. The contract to provide the Loma Ranger Shuttle service was awarded in June 1980 to a private sector operator who continues to provide the service today.

HUMPHREY GO BART

In 1976 BART, in cooperation with the University of California, Berkeley, established the Humphrey-Go-BART Shuttle, shuttle service running between the U.C. campus and Berkeley BART Station. The Humphrey Go BART shuttle continues operation today.

EL BARTITO

In 1978, BART in cooperation with the County of Alameda, established a private sector shuttle service running between the downtown Hayward BART station and Alameda County office complex on Winton Avenue in Hayward. This service was called the El Bartito. The El Bartito was funded jointly by BART and Alameda County and operated until 1980 when lack of patronage caused Alameda County and BART to terminate operation.

OAKLAND AIRBART

In 1980, BART in cooperation with the Port of Oakland established the Oakland-AirBART, a private contractor operated shuttle which runs from the Coliseum BART Station to the Oakland Airport. The AirBART shuttle is funded by the Port of Oakland and BART through an agreement developed in 1980.

BART SHUTTLE POLICY

In January of 1983 the BART Board of Directors approved a resolution designed to encourage BART area employers to develop private sector shuttle services to operate to BART stations. The BART shuttle policy provides incentive for employers to retain private sector shuttle operators to operate new services by offering a 50% subsidy in return for an assurance that 90% of the shuttle patrons will transfer to and from BART.

Notice Section III.C.2

"Describe outcome of analysis of existing services and operations."

See above.

Notice Section III.C.3

"Were fully allocated costs for public operations considered?"

See above.

Notice Section III.C.4

"What further analysis of existing service or operations are planned during the next 12 months?"

Staff will conduct a study to assess the feasibility of contracting out the operation of BART Express Bus service. See broader outline in the next section.

Notice Section III.D.1

"Describe efforts to develop and analyze private sector investment strategies."

In general these efforts have centered in four major areas: Station concessions, alternative power sources, joint development, and lease (joint use) of right of way. A breakdown of sources from these and other areas is shown below:

Sources Of Revenue:

- Passenger fares
- BART Shuttle Services Revenue
- Express Bus Revenue
- Muni-BART Joint Pass Revenues
- Concession Revenues
- Advertising Revenues
- Fiber Optics Revenues
- Rental Revenues - Buildings & other property
- Parking Revenues
- Fines & Forfeitures
- Interest Earnings on temporary investments
- Financial Assistance - Local
- Financial Assistance - State
- Financial Assistance - State Mandated Costs
- Property Taxes
- Sales Tax Receipts

° Concessions & Advertising

BART derives revenue from both rental of concession space in stations and from advertising. We will continue to cooperate with private business to expand this fund source. An example would be the ongoing effort to place Automatic Teller Machines in stations. Such machines, if installed, would allow BART receive revenues through a transaction fee. In addition, the machines could potentially offer high value tickets which reduce costs and cash collection requirements.

- ° Alternative Power Sources

BART traction and auxiliary power is currently purchased from Pacific Gas and Electric Co. Rates are increasing and over the years a number of alternatives to this single source have been explored. An example was an analysis of a cogeneration proposal from a private firm two years ago. The project would have used waste material from an agricultural product processing plant to generate electricity. The private participant pulled out of the project when energy costs began to fall.

Currently, BART is conducting an extensive study of alternative energy sources. The study includes investigation of a private enterprise cooperative arrangements as means of reducing escalating energy costs.

- ° Joint Development

See discussion under Notice Section III.D.2.

- ° Lease of Right of Way

BART currently leases space in our Transbay Tube for a fiber optic communications link. Additional opportunities for this type of use of our right of way have been considered by Board members in the past years.

Notice Section III.D.2 and Notice Section III.D.3

"Describe procedures for joint development and any current joint development projects."

"Describe efforts to involve local firms and developers in providing fixed facilities."

What follows is a brief overview of BART' joint development process and our progress to date. A detailed description of the policy underlying our efforts may be found in the Station Area Development Implementation Policy which follows. In addition, the basic BART Joint Development Policy as embodied in BART Board Resolution #2837 is included.

Most BART stations are surrounded by several BART-owned acres of surface parking. At a few of these stations, land values have risen to a point where they constitute a valuable potential source of revenue to BART.

In making decisions about how best to use this or any asset, BART must determine how the management of its assets can best serve its primary role as a public transit provider. Most of those stations with surface parking serve low-density suburban areas, where the private automobile remains the predominant means of access. Consequently, a key part of any plan for joint development is a strategy for preserving and, where necessary, expanding patron parking. While this strategy may vary from one station to the next, as a general rule joint development at BART must at least provide for replacement of the surface parking it displaces. BART's return on a

given project is thus a function not of the market value of the site, but rather of the cost of the replacement parking.

BART seeks an internal rate of return on joint development which is comparable to IRRs obtained by private developers. When a project meets this criterion, the site is conveyed to the developer by a long-term (50-60 year) ground lease which includes some BART participation in gross revenues. This method has advantages for everyone: it reduces the developer's up-front outlays by spreading land cost over the life of the project; it enables BART to both capture future increases in the value of the site and control its future use; and - through a possessory use tax on the land as well as property tax on the improvements - it provides an alternative tax to an exempt parcel.

Our interest in land use, of course, goes beyond our own property. The concentration of development around suburban BART stations not only makes our station sites more valuable; it also increases the market for BART's transit services. Moreover, to the extent these new trips run counter to peak flow (suburbs-downtown-suburbs), they make use of the system's excess capacity.

The joint development project closest to realization is the one at the Pleasant Hill station in Contra Costa County, CA. BART joined with the County and the neighboring cities of Walnut Creek and Pleasant Hill to prepare a specific plan for 125 acres of unincorporated land surrounding the station. This part of the County has recently experienced a boom in commercial development which has overtaxed the infrastructure. The purpose of the plan was twofold: to concentrate future growth in an area served by BART, and to expand the capacity of the area's infrastructure to accommodate it. The plan culminated in a BART-county development agreement, under which BART's right to develop up to 1.26 million sq. ft. of commercial space on its own property is protected for 10 years. In return, BART pays approximately \$3 million in pre-paid development fees and approximately \$3 million worth of land transfers toward new roads and sewage systems for the area. The plan allows up to 3.2 million sq. ft. of commercial space in the area: development plans have been approved for all the non-BART parcels, and BART is currently negotiating terms for its own site with prospective developers.

Joint development plans are also underway for two more sites in Concord and Fremont, CA. At both these sites, the City General Plans must be revised; we expect to complete plans and secure approvals by the end of 1986. A fourth site, Lake Merritt station in downtown Oakland, CA, is already zoned for high intensity use, and is being actively marketed.

BEFORE THE BOARD OF DIRECTORS OF THE
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

In the matter of Adopting a
Joint Development Policy /

Resolution No. 2837

WHEREAS (1) The Board of Directors of the San Francisco Bay Area Rapid Transit District wishes to augment the "Policy on Developing Income from District-owned Real Property" (Resolution No. 1369, dated July 3, 1969, as amended by Resolution No. 2544, dated March 24, 1977); and

(2) Ridership and revenue benefits can accrue to the District through development projects in cooperation with public and/or private entities and those benefits should be considered in the development of any lease or sale agreement; and

(3) BART station development(s) should complement the surrounding area and assist the achievement of neighborhood, community, city, and regional goals and objectives; and

(4) Aggregation of numerous small parcels into fewer larger parcels near stations may enhance the potential for development most compatible with regional mass transit; and

(5) The Board wishes to provide a basis for the initiation of and response to joint development proposals;

NOW, THEREFORE, BE IT RESOLVED:

(1) That joint development projects shall be considered in the development of any sale or lease agreement.

(2) A joint development project involves the use of District air rights or excess real property as part of a development which increases BART patronage and operating revenues.

(3) Staff is directed to compile a Joint Development Plan for the BART station areas which will assess the development potential at each station, including a development sphere of interest and appropriate strategy for BART involvement, working with required governmental entities as necessary.

(4) The plan will identify mechanisms through which the District may participate in joint development, including, but not limited to:

(a) The optimum method(s) of District participation and appropriate financing mechanisms, including, but not limited to: use of air rights; long-term lease agreements; use of real property to obtain an equity involvement; cooperative development ventures, such as the Urban Initiatives Program; and sale agreements.

(b) Provision of transportation-related facilities which will stimulate joint development projects.

(c) Staff assistance to private enterprise development efforts which support the Joint Development Plan.

(d) Acquisition by BART of adjoining parcels which are key to the implementation of the development plan for each station, to the extent authorized by law.

(e) A catalogue of existing excess property and its development potential, both individually or aggregated into larger parcel(s), through acquisition or joint development agreement with other public or private entities.

(f) Legislative efforts to provide expanded statutory authority, where necessary.

(5) Where the Plan finds that a development potential exists, staff is directed to actively seek proposals which will result in projects supportive of BART system objectives.

(6) Development proposals will be presented to the Board of Directors and evaluated upon the following considerations:

(a) Extent to which the project increases BART patronage and revenue, and increases BART's operating ratio in the long run.

(b) Compatibility with local neighborhood, community, city, and regional objectives.

(c) Flexibility provided to expand or modify the project in the future.

(7) The valuation of District property and air rights for joint development purposes will be based upon the following considerations:

(a) The price of nearby properties.

(b) The expense necessary to make the property developable (utilization of air rights).

(c) Patronage and other revenue benefits to BART resulting from the project.

(8) Every effort will be made to link new, or, where possible, existing developments adjacent to the station through direct entrances to BART.

#

EXHIBIT CSTATION AREA DEVELOPMENT IMPLEMENTATION POLICYI. INTRODUCTION

The San Francisco Bay Area Rapid Transit District (BART) is custodian of a large-scale public investment which includes important real property assets. To date, much of this property has not been used in ways which take advantage of its full revenue-generating potential. In many cases, these properties can sustain additional profitable uses supportive of the District's main transit function. Through careful management, these assets can contribute significantly to the on-going financial viability of the transit system. Development of these properties also promises to provide substantial benefits to local jurisdictions and to encourage private sector participation in the public development process. By promoting high quality, more intensive development on or near BART-owned properties, the District intends to generate new revenues for transit while also creating attractive investment opportunities for the private sector and facilitating local economic development goals. Such an approach to value capture assumes overlapping interests between the public and private sectors, and views cooperative real estate ventures as offering a positive means for the private sector to contribute to the support of transit.

II. PURPOSE AND SCOPE

The enabling legislation for the San Francisco Bay Area Rapid Transit District grants BART the powers to purchase, lease and sell real property necessary to construct and operate a regional rapid rail system. These powers include the right to enter into long-term leases (or sales) involving real property rights, both surface and air rights, and/or direct connections from privately owned developments to BART facilities. Specific District policy concerning the development of income from District-owned real property was originally outlined in Resolution No. 1369, dated July 3, 1969, and amended by Resolution No. 2544, dated March 24, 1977. On December 18, 1980, the Board augmented this policy by adopting Resolution No. 2837 which commits the District to consideration of joint development projects in the development of sale or lease agreements involving District-owned property or air rights.

To carry out this charge, Station Area Development was established as a new program area within the District. The purpose of the present policy is to supplement Resolution No. 2837 by outlining specific goals and objectives for the Station Area Development Program; defining program functions; and establishing policies and procedures for carrying out the program.*

*(For a more detailed discussion of key issues underlining these policies and procedures see "Station Area Development Implementation Guidelines," staff and consultant findings and recommendations, prepared April 1984. Available from the Department of Planning & Analysis.)

III. IMPLEMENTATION STRATEGY

A. Definitions

BART's Station Area Development Program represents the District's commitment to the general concept of "joint development." In its broadest sense, this term suggests active cooperation between the public and private sectors in undertaking real estate ventures which either physically connect to or functionally support the transit facility. For the purposes of this policy, the term joint development is also meant to cover those value capture mechanisms aimed at ensuring that the public shares in the benefit which accrues to the private sector (property owner/developer) because of improved access to a regional transit facility. A variety of mechanisms, applied singly or in combination, should be considered in pursuing joint development/value capture projects including, but not limited to, the following:

1. Leasing or sale of land or air rights by the District.
2. Co-development of property with a private owner/developer.
3. Consideration of development opportunities in the acquisition of land, location of stations, and construction of facilities.
4. Sale and lease-back of District constructed facilities.
5. Negotiation of fees for special entrances between privately-owned developments and District facilities.
6. Capital construction offsets.
7. Dedication of land and construction easements by developers.
8. Benefit assessments.

Certain of these mechanisms would pertain particularly to rail extension projects and should be fully evaluated in planning for new transit facilities.

B. Goals and Objectives

Each of the mechanisms cited above is aimed at generating new sources of revenue and/or capital offsets for the transit district which is the primary goal of the Station Area Development Program. The term joint development also implies, however, the more generalized intention of coordinating land use and transit planning in the interest of establishing development patterns which enhance transit use. Taking into account these overlapping concerns, the District has established specific goals and objectives for the program which are consistent with the intentions of Resolution No. 2837 and which focus on potential benefits of the program for the District and the community at large. These are as follows:

Overall Goal:

To generate new sources of income (and/or capital offsets) and to increase transit ridership through cooperative public/private sector development projects on or near District-owned properties.

Specific Objectives:

1. To coordinate comprehensive planning and development around station sites.
2. To enhance local community economic development efforts through better utilization of transit and transit-owned properties.
3. To return real property to the tax rolls and to increase the community tax base.
4. To help create new investment opportunities for the private sector which are supportive of transit.
5. To reduce auto use and traffic congestion through the encouragement of transit-linked development.

C. Approach

In order to achieve the goals and objectives outlined above, the Station Area Development process focuses both on generation of new revenues from near-term disposition of properties and on longer-range planning activities aimed at creating transit supporting land uses. Selection of sites for near-term disposition versus longer range planning activities will be based on a close analysis of prevailing market conditions in order to protect District financial interests and as a means of establishing program priorities. (See Figure 1.) To ensure that disposition of these properties supports the District's primary transit and revenue generation goals, BART has adopted an approach to development which is both active and cooperative in relation to potential public and private sector partners. This approach emphasizes the need:

1. To weigh development objectives at each site in relation to the District's primary mission as a transit operator.
2. To coordinate closely with local land use authorities in identifying and implementing development opportunities on and around BART station properties.
3. To market and develop sites at a time and in a manner which maximizes their value.
4. To utilize the skills and experience of private developers in carrying out the development of District properties.

This approach is intended to create benefits which both enhance the public investment in transit and support community and private development goals.

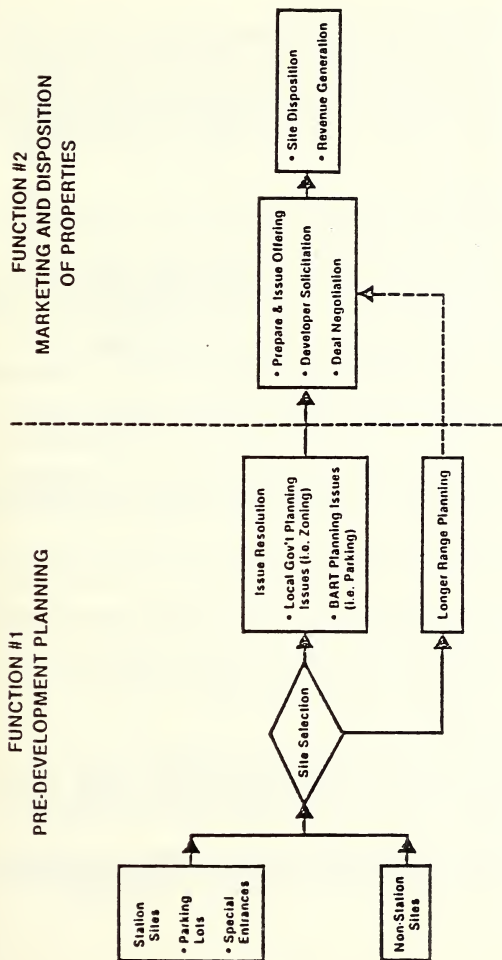


FIGURE 1. STATION AREA DEVELOPMENT

IV. STATION AREA DEVELOPMENT IMPLEMENTATION POLICIES

The District's joint development policy, Resolution No. 2837, provides the general direction and intent of the Station Area Development Program. The present set of policies supplements that resolution by providing specific guidelines for the District in conducting business with public and private sector entities involved in development projects on or near BART-owned properties.

A. General Policies

The following general policies will govern the District's approach to joint development and value capture projects.

1. The District shall work cooperatively with local jurisdictions, redevelopment agencies, developers, and other public and private sector entities to promote land use policies which encourage intensive, high quality development on and surrounding station properties.
2. The District shall pursue an approach to land development and disposition which maximizes its ability to participate in the increase in value of its property assets over time.
3. The District shall adopt an approach to program management which ensures a predictable and timely decision-making process aimed at fostering a positive investment climate for the private sector.
4. The District shall promote joint development projects which enhance use of the transit system and shall actively encourage direct connections to stations from surrounding developments in order to promote pedestrian access.
5. The District shall actively seek to involve DBE's, WBE's, and MBE's in joint development projects.
6. The District shall assume an active project packaging role in preparing its sites for development.
7. The District shall consider joint development opportunities in the acquisition of additional property, the location of new station sites, and the construction of station facilities.

B. Land Use Policies

The following policies will govern the way in which the District coordinates the use of BART-owned properties with local land use authorities and the manner in which the Station Area Development program takes into account existing as well as future transit-related uses of District property.

1. The District will negotiate with local jurisdictions regarding mutually desirable land uses and intensity of development on BART properties before marketing these properties for commercial development.

These negotiations will, to the extent feasible, also address land uses on non-District owned properties surrounding the stations with the aim of encouraging land use patterns supportive of transit.

2. In the course of formulating development plans, Station Area Development staff will coordinate closely with other BART programs, departments and offices concerned with the long-term use of station properties in order to ensure protection and enhancement of transit objectives in the development of BART sites.
 3. As a part of the Station Area Development planning process, a specific parking strategy for a given station will be established which is consistent with the parking expansion goals and financing approach outlined in the Access Implementation Program. This parking strategy will be based on the principle of establishing expansion parking goals on a line segment rather than strictly on a station by station basis in order to balance development and access objectives. Cost efficient parking design and management guidelines, approaches to maintaining future development options, and mechanisms for protecting spaces intended for BART patrons from nonpatron use will also be included.
- C. Developer Selection, Disposition and Negotiation Policies

The following policies will govern the District's approach to developers and its negotiating posture in the disposition of BART property for joint development purposes.

1. The disposition strategy and negotiation criteria for each joint development project will be established on a project by project basis which takes into account special circumstances particular to a given site as well as project history and specific project objectives.
2. The District will seek to achieve a financial return from joint development projects over and above replacement of existing patron parking required to accomplish a project.
3. The District will generally solicit proposals for joint development of District-owned property through a competitive selection process, except in cases where sole source negotiations would result in more favorable conditions for the District.
4. The District will consider DBE, WBE and MBE participation in evaluating specific development proposals.
5. The District will generally favor long-term leases rather than sale of property as the standard disposition strategy for joint development projects, except in cases where alternative approaches are required to achieve specific development objectives or where other strategies would generate more attractive financial returns to the District.
6. The District will generally seek to negotiate deal structures which provide for an increase in revenues to BART over time, such as participation leases.

7. Where appropriate and/or financially feasible, the District will seek to infuse public sector capital or "in lieu" contributions to leverage joint development projects.
8. The District will pursue an approach to deal negotiation that maximizes confidentiality during the course of negotiations.

Notice Section III.D.4

"Describe consideration of any financing arrangements with the private sector."

The following lists current BART bond obligations and past issues:

\$12,000,000 Special Service District #1 Bonds of which \$7,150,000 are outstanding. These bonds were issued for construction of subway extensions within the city of Berkeley. These bonds were issued against property taxes.

\$792,000,000 General Obligation Bonds of which \$530,575,000 are outstanding. These bonds were issued for the purpose of financing the construction of the basic system. These bonds were issued against property taxes.

\$16,000,000 - 1983/84 Subordinated Sales Tax Anticipation Notes of which none are outstanding. These were issued to provide interim financing to defray operating expenses payable from the General Operating Fund. These were issued against sales tax receipts.

\$19,860,000 - 1984/85 Subordinated Sales Tax Anticipation Notes of which none are outstanding. These were issued to provide interim financing to defray operating expenses payable from the General Operating Funds. These were issued against sales tax receipts.

\$150,000,000 Sales Tax Revenue Bonds, Series 1969 of which none are outstanding. These were issued for the purpose of providing additional funds to be applied toward completion of the basic system. These were issued against sales tax receipts.

\$24,000,000 Sales Tax Revenue Bonds of 1975 of which none are outstanding. These bonds were issued for the purpose of providing the District with supplemental temporary revenues for operating purposes. These were issued against sales tax receipts.

\$65,000,000 Sales Tax Revenue Bonds - Series 1982 of which \$63,965,000 are outstanding. These bonds were issued against sales tax receipts. These were issued to pay a portion of the cost of the acquisition of 150 rail transit vehicles and related automatic train control equipment.

\$145,000,000 Sales Tax Revenue Bonds - Series 1985 of which \$145,000,000 are outstanding. These were issued against sales tax receipts. \$69,185,000 were issued to refund the 1982 Sales Tax Revenue Bonds - Series 1982 and \$75,815,000 were issued for system improvements.

\$21,775,000 - 1985/86 Subordinated Sales Tax Anticipation Notes of which \$21,775,000 are outstanding. These were issued to provide interim financing to defray operating expenses payable from the General Operating Fund. These were issued against sales tax receipts.

\$10,900,000 Grant Anticipation Notes - Series 1984 of which \$1,810,000 are outstanding. These were issued against certain grant receipts and other revenues of the District. These Notes were issued to provide interim financing for certain capital expenditures prior to the receipt of certain anticipated revenues.

\$45,025,000 Grant Anticipation Notes - Series 1985 of which \$45,025,000 are outstanding. These were issued against monies which are to be received from the State or UMTA by the District as reimbursements for expenditures made pursuant to the correspondent Grant. These notes were issued to provide interim financing for certain capital expenditures prior to the receipt of certain anticipated revenues.

In addition, the District intends to enter into a sale and lease-back of the transit vehicles pursuant to Section 31 (Q)(5) of the Tax Reform Act of 1984.

II. BART Future Plans

In addition to continuing programs described previously BART plans to embark on an effort next year to improve coordination and focus in the private enterprise participation efforts. This future work will center around the SRTP. In support of that planning effort we plan to undertake an UMTA Privatization Study. The next page is a draft outline of that study. The focus will initially be on drafting a BART Board policy on the subject. That policy will be taken to the BART Board early in the next planning cycle. In addition, the study will attempt to set in place the mechanism for ongoing review and coordination of these efforts. The SRTP will serve as the source which documents and provides the plan for future year's work.

PRIVATE ENTERPRISE PARTICIPATION:
SCHEDULE FOR THE ANALYSIS OF
BART'S EXISTING PUBLIC SERVICES

In compliance with the UMTA notice issued on January 24, 1986 in the Federal Register, Vol. 51, No. 16, the San Francisco Bay Area Rapid Transit District has developed a schedule for conducting an "analysis of existing public services to determine if services can be provided by private operators." This analysis is expected to provide four primary products:

- 1) A revised local private sector policy for adoption by the Board of Directors,
- 2) a list of functions performed as part of BART's mass transit service that may be appropriate for private sector participation.
- 3) a method for determining the fully allocated cost of BART's providing the functions outlined above, and
- 4) a description of the procedures which will be used to seek proposals from private and public mass transportation entities and to fairly and equitably evaluate such proposal, i.e., the competitive review process.

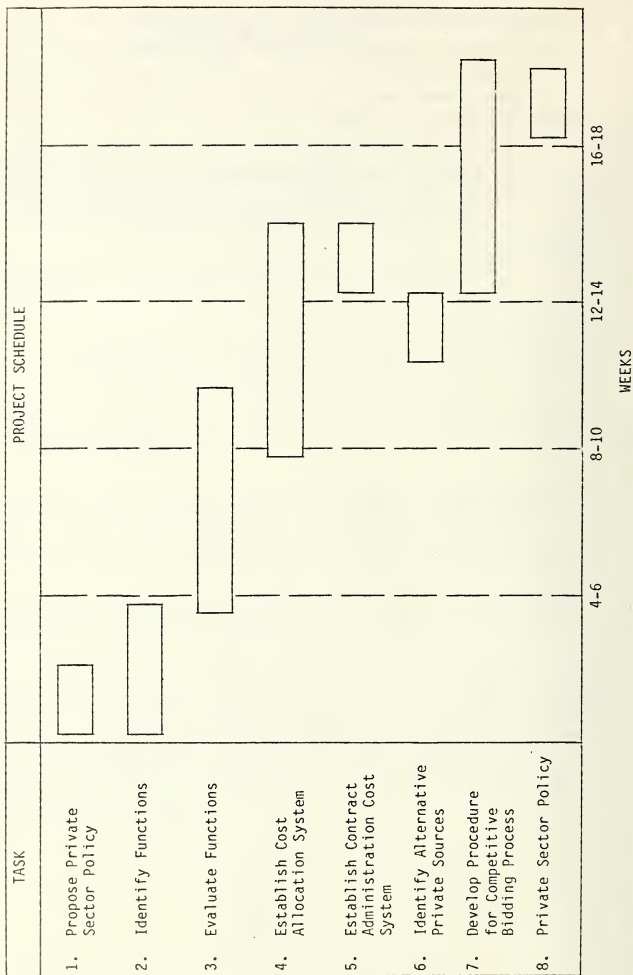
This analysis is estimated to require seven (7) to nine (9) person-months of effort and could be completed within four to five months.

Two major reasons for the large effort associated with this project are 1) the need to establish a framework for developing the guidelines to determine which functions may be appropriate and 2) the need to establish a cost allocation system for determining the cost to BART of performing various functions. Subsequent analyses of BART's public services should only take one-half to one-third the effort and time.

One important element that has been kept as a separate task is establishing a system for measuring the cost to BART of administering contracts. This cost should be added to the District's full purchase price of service from a private operator when comparing the costs of the District and private operators providing a service.

The attached project schedule is meant to provide an overall picture of the work to be done. The time frames are only rough estimates and are subject to revision as further regulations are promulgated by the Secretary of Transportation.

ANALYSIS OF BART'S EXISTING PUBLIC SERVICES
(PRIVATE ENTERPRISE PARTICIPATION)



OVERVIEW OF THE ANALYSIS OF BART'S EXISTING PUBLIC SERVICES

To analyze BART's existing public services and to develop a procedure for the competitive bidding process, the District will undertake a four- to five-month study. The primary objective of this study is to determine the most cost-effective ways for BART to provide its mass transportation service, both in the operational areas and in the support functions.

The first step toward initiating this analysis will be the adoption by the District's Board of Directors of a policy on private enterprise participation. This policy statement will provide a framework for the analysis of BART's existing public services. The policy will establish the general parameters that will guide those involved in the identification, evaluation, and costing of services to be included.

The analysis of BART's existing public services will first require that a list of functions being performed at BART be generated. The UMTA Section 15 reporting procedure would be a reasonable basis for developing this list. More refined categories will probably be required, especially in the support areas. Methods for determining how much administrative and general support effort should be allocated to each function will need to be designed.

Each function will then be evaluated to determine whether that function lends itself to private enterprise participation. As part of this evaluation, criteria will be developed for judging the appropriateness of including a function in the program. The close scrutiny that these criteria are expected to receive will necessitate that a thorough investigation of all factors be done. Therefore, a major portion of the study's effort will be devoted to this task.

For those functions that are judged amenable to private enterprise participation, a means of measuring the actual cost to the District will have to be designed. In this case, the procedure for submitting the Section 15 data to

UMTA will again provide a starting point. However, a preliminary investigation showed that the cost of many functions are grouped only by cost center. New work order numbers and function codes would have to be created in order to obtain cost data on a more specific basis. Furthermore, the fact that much of the Section 15 data is generated by manual calculations would indicate the need to develop new computer programs to provide the data quickly and easily for cyclical reviews.

An important element in designing this cost-allocation system is to provide a means for determining the cost to the District of administering contracts with private operators. The following tasks would be included in this function:

- 1) Developing the contract,
- 2) Managing the contract, and
- 3) Providing oversight for the service being contracted out.

New work order numbers and function codes would have to be created for this contract administration function.

At the same time that the cost-allocation system is being designed, a list of alternative private sources would be generated. MTC has indicated that they would either develop such a list themselves or help coordinate the assembling of lists already used by transit agencies in the nine Bay Area counties. Depending on the functions chosen for private enterprise participation, further research of potential providers in the private sector may be necessary. The research will also provide information on the means for notifying private operators of opportunities at BART.

The final task in the study will be developing the actual procedure for implementing the private enterprise participation process. The procedure will specify the methods for notifying the private sector of opportunities to submit proposals to BART. The procedure will also describe the process to be used in evaluating those proposals. This documented procedure and the evaluation that was performed earlier will enable the District to adopt a revised policy on private enterprise participation.

ANALYSIS OF BART'S EXISTING PUBLIC SERVICES
(PRIVATE ENTERPRISE PARTICIPATION)

- 1) Develop a draft policy on private sector participation for adoption by the Board of Directors.
- 2) Identify functions being performed as part of BART's existing public services.

- o Rail operations - vehicle operators, station agents, etc.
- o Maintenance - vehicle, station, and facilities
- o Materials management
- o Support - scheduling, planning, etc.
- o Express bus services
- o Shuttle services
- o Other

(UMTA Section 15 reporting procedure could be used as an initial basis for defining various functions)

- 3) Evaluate which functions and to what extent they can feasibly be put up for private sector contracting.
- o Investigate legal constraints and necessary steps to change.
 - o Investigate impact of labor contracts and 13(c) issues.
 - o Investigate liability/litigation ramifications.
 - o Review certification requirements.
 - o Address confidentiality issues.
 - o Assess insurance requirements and impact on private operators.
 - o Establish minimum staff needed internally (management, oversight functions, quick response requirements, continuity, etc.).
 - o Evaluate other impediments.

- 4) Establish a cost allocation system for measuring the cost to BART of providing each function.

- o Direct Costs
 - Labor
 - Contract Fees
 - Materials
 - Power/Fuel
 - Other
- o Indirect Costs
 - Supervision
 - Benefits
 - Administration
 - Overhead
 - Other

(The development of new work order numbers and function codes for BART's labor accounting system would be necessary. New computer programs may be needed.)

- 5) Establish a contract administration cost system.

- o Cost to develop the contract.
- o Cost to manage the contract.
- o Cost to provide oversight for the service contracted out to a private operator.

- 6) Identify alternative private sources.

(Coordination with MTC and other public transit agencies will aid this task.)

- 7) Develop a procedure for letting contracts.

- o Investigate and determine process for notifying private sector of opportunity to submit proposals for providing specific functions.

- o Investigate and define a process for fairly and equitably evaluating proposals submitted.

(Revised private sector policy would be prepared for submission to Board of Directors.)

- 8. Develop revised policy on private sector participation for adoption by the Board of Directors.





BAY AREA RAPID TRANSIT DISTRICT

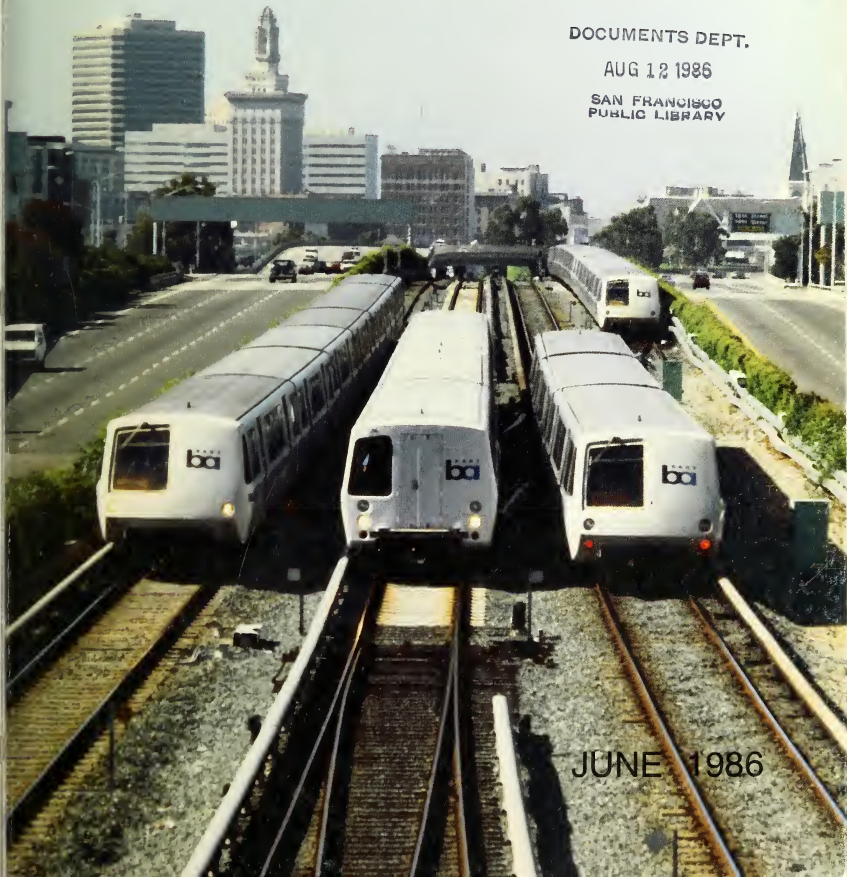
1986 FIVE-YEAR PLAN

DOCUMENTS DEPT.

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JUNE 1986



BART FACTS
FY 1985/86 YEAR-TO-DATE DATA
(JULY 1985 - MAY 1986)

****FIXED FACILITIES****

Mainline Track: Revenue service is provided over 71.5 miles of double mainline track, of which approximately 20 miles are in subway, 24 elevated, and 27 at grade.

Stations: There are 34 stations including 14 in subway, 13 elevated, and 7 at grade. Average station spacing is between 1/2 to 1 mile within and adjacent to San Francisco, Oakland, and Berkeley downtown areas, and 2 to 4 miles apart in suburban areas. Automatic fare collection equipment is located in each station to vend and process patron tickets. BART provides 24,100 free parking spaces at 23 stations and 190 spaces at one additional station at a daily charge of 25¢ per space.

Maintenance Facilities: Equipment maintenance is performed at three Eastbay yards located in Hayward, Concord, and Richmond. A special track geometric vehicle is used to analyze the running rails and electrical third rail. Maintenance of right-of-way is routinely performed during off-revenue hours.

Administrative/Central Control Center: Trains are automatically controlled by wayside equipment and supervised by the central computer at BART headquarters located above the Lake Merritt Station in Oakland. Operators on board the leading A-car of each train have full voice communication with central control personnel and passengers on board, and can override automatic controls should the need arise.

****ROLLING STOCK****

Fleet Inventory: As of May 1986, BART owns 137 control equipped A-cars and 303 trail B-cars, of which 128 A-cars and 290 B-cars are in the operating fleet. Of the remaining vehicles, 16 are rotated out for fire hardening improvements, 2 A-cars are retained as engineering test vehicles, and 4 cars are removed from the operating fleet as the result of heavy damage. Each vehicle contains 72 seats and is 10.5 feet wide. Vehicle lengths are 75 feet for A-cars and 70 feet for B-cars.

Trains: Train lengths range from 3 to 10 cars and consist of 2 A-cars (one at each end) and between 1 and 8 B-cars. Corresponding seating capacity is between 216 and 720 passengers. Top speed is 80 mph with a system-wide average of 33 mph, including station stops. Trains stop at each station along a designated route.

****SERVICE HOURS****

Rail: Rail service is provided between the hours of 5 am and 1:30 am Monday through Friday, 6 am to 1:30 am on Saturdays, and 9 am to 1:30 am on Sundays and major holidays. Closings for individual stations are timed with the schedule for the last train beginning at approximately midnight. Service frequencies (in minutes) for individual routes and line segments are as follows:

	TRANSBAY ROUTES			EASTBAY Richmond- Fremont	CBD LINE SEGMENT	
	Concord- Daly City	Fremont- Daly City	Richmond- Daly City		San Francisco	Downtown Oakland
WEEKDAY						
Peak Hour	7.5	15	15	15	3.8	3.8
Midday	15	15	15	15	5	5
Night	20	*	*	20	20	10
SATURDAY						
Daytime	20	20	20	20	6.7	6.7
Night	20	*	*	20	20	10
SUNDAY/HOLIDAY						
All Day	20	*	*	20	20	10
*Requires transfer between Concord/Daly City and Richmond/Fremont routes						

Express Bus: The District also provides express bus service within major travel corridors not served by rail in both Alameda and Contra Costa counties in the Eastbay. Bus service frequencies (in minutes) are as follows:

	Eastern Contra Costa	Western Contra Costa	Central Contra Costa-Alameda	Eastern Alameda
WEEKDAY				
Peak Hour	15	30	30	30
Midday	30	30	30	30
Night	60	60	60	60
SATURDAY				
Daytime	60	30	45	30
Night	60	60	60	60
SUNDAY/HOLIDAY				
All day	60	*	60	60
*No service during this time period.				

(Continued on inside back cover)

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B A Y A R E A R A P I D T R A N S I T D I S T R I C T

F I V E Y E A R P L A N

FOR THE PERIOD JULY 1986 THROUGH JUNE 1991

The preparation of this report has been financed in part through a grant from the United States Department of Transportation, Urban Mass Transportation Administration under the Urban Mass Transportation Act of 1964, as amended, as passed through the Metropolitan Transportation Commission.

The contents of this report reflect the views of BART, which is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the original views or policy of the U.S. Department of Transportation. This report does not constitute a standard, specification, or regulation.

FRONT COVER PHOTO: Middle foreground train consisting of 4 prototype C-Cars being tested on the recently completed KE Track in downtown Oakland, the newest mainline and storage track additions to the system.

JUNE 1986



SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

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Research Section
Department of Planning & Analysis
Bay Area Rapid Transit District
800 Madison Street
Oakland, California 94607



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SUMMARY





BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (415) 464-6000

June 1986

TO BART PATRONS AND DISTRICT RESIDENTS:

NELLO BIANCO
PRESIDENT
EUGENE GARFINKLE
VICE-PRESIDENT
KEITH BERNARD
GENERAL MANAGER

During this past fiscal year, BART reached an important milestone in its program to expand system capacity. A majority of the funding for this effort is now committed, and implementation of the Capacity Expansion Program is well underway.

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7TH DISTRICT
EUGENE GARFINKLE
8TH DISTRICT
JOHN H. KIRKWOOD
9TH DISTRICT

The signing of a Full Funding Agreement this Spring with the Urban Mass Transportation Administration (UMTA) provided a federal commitment to the Daly City Turnback and Yard Project. Combined with earlier state and federal grants and other BART generated funds, the Capacity Expansion Program is now over 93% funded. This achievement is enhanced by the current estimate of \$491 million to complete this program compared to the budget estimate of \$550 million cited in last year's Five Year Plan update. Earlier this fiscal year BART sold revenue bonds to raise an additional \$70 million to ensure completion of the Capacity Expansion Program and to construct additional parking.

Last fall, four prototype C-Cars were delivered and have been undergoing an extensive set of tests. The production phase of the project gets underway in 1987 and will add a total of 150 cars to the fleet. Meanwhile, the Firehardening Program is approaching completion which will allow full use of the existing fleet.

Construction of the third line through downtown Oakland (the KE Track) was completed this year and regular service began this spring. It gives additional capacity and flexibility at the center of the BART system. The construction of the Daly City Turnback is well underway, and preliminary work on the Yard site to the south has also begun.

These capacity expansion projects fit together to give BART a significant increase in capacity before the end of the decade. The program is essential to the continued development of the three-county system and will enable BART to continue to function as an attractive alternative to the automobile for longer, intra-regional trips.

The absence of sufficient capacity has been one of the causes of a phenomenon new to BART: static ridership levels. Crowding, limited parking, and recently falling gasoline prices have resulted during the past year in a leveling out of BART ridership even before the fare increase this past January.

The fare increase resulted in a ridership loss near projected levels and patronage has been stable since.

Resumption of continued patronage growth is a major BART objective. The importance of this task is paramount with the cutbacks in state and federal assistance to public transit, which increases the dependence on operating revenues. Continued financial stability of the BART system will require a combination of patronage growth and close scrutiny of operating costs.

A key element in encouraging maximum utilization of BART will be continued commitment to a high level of service as we bring the Capacity Expansion Program on line. Additional transit cars, more frequent trains, and expanded parking facilities will work together to make the system attractive to more people. As these projects are implemented, careful attention to maintaining system performance will be necessary.

A parallel effort to limit increases in operating costs will need to continue. Programs throughout the BART District will need to be reexamined and evaluated in the perspective of more limited funding.

The 1986 update of BART's Five Year Plan follows the format utilized in previous plans: Chapter I reviews key planning issues, chief among which is the reevaluation of projected ridership growth; Chapter II documents the operations and capital improvement program, including the FY 1986/87 operating performance objectives; Chapter III presents the District's five-year financial plan, including both operating and capital projections.

District policy, as reflected in BART goals and objectives, is summarized in Figures 1, 2, and 3 starting on page S-3. Figure 4 on page S-10 summarizes the planned improvement steps in the Capacity Expansion Program. The operating and capital financial requirements needed to support the Five Year Plan are summarized in Figures 5, 6, and 7 beginning on page S-12.

The primary messages of this Five Year Plan are clear:

1. The Capacity Expansion Program is largely funded and on its way towards realization.
2. Because of a variety of factors, farebox revenue and grant sources are below projections. The operating deficits forecast for BART cannot be accepted and steps to resolve the deficits must be identified and implemented.

These conditions present a significant challenge to BART and its 2,300 dedicated employees, whose talents and skills will meet this current need as they have done in the past.


Keith Bernard
General Manager

FIGURE I
BART GOALS FOR FY 1986/87

1. Operate scheduled 4-route weekday service with route headways of 15 minutes or less during peak and midday periods and expand service within feasible, technical, and financial limits including improved peak-hour frequency of service and capacity where needed.
2. Improve the reliability performance of the present BART system.
3. Continue to improve BART system and patron safety and emergency preparedness.
4. Increase system utilization by promoting BART travel for all purposes with special emphasis on offpeak and reverse commute trips.
5. Fund and implement the necessary capital improvements and replacements to the system.
6. Operate within available funds without incurring an unfunded deficit.
7. Maximize the contribution to operating costs from passenger revenues, consistent with reasonable fare levels, to achieve a farebox ratio above 50%.
8. Make every effort to achieve District objectives for female and minority employment and minority business enterprise participation.
9. Improve system access by means of a comprehensive program of parking expansion, BART feeder services, transit coordination, and special projects addressing elderly and handicapped mobility.
10. Develop station area sites for the realization of increased patronage and revenues, and to enhance the communities BART serves.
11. Extend BART trunk lines within Bay Area travel corridors where feasible and in support of regional land use policies.

FIGURE 2: BART PERFORMANCE OBJECTIVES FOR FY 1986/87

BASIC SYSTEM SERVICE AND CAPACITY

1. Balance capacity where possible such that load factors for peak period trains which can be lengthened or shortened (consists between 3 and 10 cars) are relatively equal and provide offpeak service such that no train load factor exceeds 1.05.
2. Operate weekday peak period Transbay service in the peak direction providing at least 98.0% of scheduled train throughput and 97.5% of scheduled car throughput on a monthly average basis.
3. Until December 31, 1986, make available 102 A-cars and 261 B-cars for revenue service by 4 AM (weekdays); thereafter, make available 106 A-cars and 270 B-cars.
4. Increase peak period capacity from 43 trains to 45 trains by adding one train each to the two most heavily travelled routes (Fremont/Daly City and Concord/Daly City) by January 1987.

RELIABILITY

1. Complete 99% of all scheduled dispatches.
2. Conduct operations such that 95% of daily terminal-to-terminal runs are completed within 5 minutes of scheduled run times with at least 93% during AM and PM peak periods for commute days.
3. Provide service such that no more than 2% of peak period trains experience a primary delay exceeding 7 minutes and no more than 6% experience a delay from any cause exceeding 7 minutes.
4. Conduct operations such that 94% of all patron trips are completed on-time. All patron trips are on-time when trains run not more than 5 minutes late or 60 seconds early.
5. Provide service such that passenger offload rates remain at or below the following: vehicle equipment = 1.10; wayside equipment = 0.10; operations and other = 0.80; and the total = 2.00 (per 1,000 car hours).
6. Maintain the overall AFC technician maintenance incident rate at or below 0.30 incidents per 1,000 passenger trips, and maintain or exceed a 6 AM average weekday availability rate of 95% for entry/exit gates and 90% for ticket vendors.
7. Maintain a 6 AM average weekday availability of 95% for elevators and 93% for escalators.
8. Maintain express bus on-time performance such that 95% of all runs arrive at their final destination within 5 minutes of schedule.

FIGURE 2: BART PERFORMANCE OBJECTIVES FOR FY 1986/87 (Cont'd.)

SAFETY AND SECURITY

1. Continue to provide an environment for patron circulation through trains and stations such that the accident rate does not exceed 17.7 per million passengers.
2. Reduce the total annual amount of employee lost time due to injuries as a percent of time worked to 0.50% or less.
3. Conduct a minimum of one emergency plan exercise per month involving emergency response agencies.

PATRONAGE AND TRAVEL PROMOTION

1. At a minimum, achieve normal growth projections for average daily patronage as follows (in 1,000's):

	<u>Jul-Sep</u>	<u>Oct-Dec</u>	<u>Jan-Mar</u>	<u>Apr-Jun</u>	<u>FY 86/87</u>
Average Weekday:	207.3	205.6	207.8	211.3	208.0
4-hour Peak:	103.6	103.0	104.4	105.8	104.2
Offpeak:	103.8	102.6	103.4	105.5	103.8
Saturday:	91.0	92.5	93.9	95.5	93.2
Sunday:	48.9	49.4	49.9	50.3	49.6

2. In addition to the above, actively promote offpeak ridership to achieve a 3% increase in travel as follows (1,000's).

	<u>Jul-Sep</u>	<u>Oct-Dec</u>	<u>Jan-Mar</u>	<u>Apr-Jun</u>	<u>FY 86/87</u>
Weekday:	3.1	3.1	3.1	3.2	3.1
Saturday:	2.7	2.8	2.8	2.9	2.8
Sunday:	1.5	1.5	1.5	1.5	1.5

3. Continue sampling procedure to evaluate train and station area cleanliness, and maintain train and station cleanliness at or above an evaluation rating of 90%.
4. Continue concern for customer relations among public contact personnel such that the rate of patron complaints about this issue remains below 8.75 per million trips.
5. Continue public announcement procedures and practices such that the rating for four categories of announcements in the Passenger Services Sampling Survey averages at least 95%.
6. Complete installation of prototype passenger information panels at 12th Street/City Center Station.
7. Begin Regional Transit Association (RTA) passenger information panels project at BART stations.
8. In addition to existing bank ticket outlets, increase tickets-to-go outlets to 125 by June 1987.

FIGURE 2: BART PERFORMANCE OBJECTIVES FOR FY 1986/87 (Cont'd.)

FINANCIAL AND OPERATIONAL EFFICIENCY

1. Maintain a funded budget and farebox ratio of no less than 13.6% for BART express bus operations and 52.3% for rail operations.
2. Maintain a rail cost per passenger mile of 20.5¢ or less.
3. Achieve a level of service output such that 14,686 vehicle miles are produced per equivalent District employee (based on 2,000 hours worked, including overtime and excluding capitalized labor).
4. Improve system utilization (passenger miles per seat mile) to 35.7% through continued monitoring of train capacity to match passenger demand patterns.
5. Maintain a paid sick leave rate of no more than 3.5% (9.1 paid days) annually per employee.
6. Transmit key performance reports to the Board of Directors, Department Managers, and/or other recipients within the following number of working days after the close of each reporting period: Monthly Patronage Report (10), Monthly Budget Performance Report and Quarterly Affirmative Action Report (15), Quarterly Financial Statements (25), Quarterly Performance Report on System Objectives (35), Quarterly Operations Performance Report (45), and the Annual Report (75).

AFFIRMATIVE ACTION

1. Complete an evaluation of District performance in relationship to the 1983/86 Affirmative Action Plan objectives for women and minorities, and develop an updated plan by December 31, 1986 to cover a five-year period.
2. Work to achieve workforce representation objectives for women and minorities in accordance with the 1983/86 plan until the update is completed, and, thereafter, in accordance with the updated Affirmative Action Plan.
3. Work to achieve 21% minority business enterprise participation for all District contracts determined to have MBE opportunities, with 18% DBE and 3% WBE participation for federally assisted contracts.
4. Work to achieve not less than 15% equity participation in District Joint Development Projects by women and minority individuals and/or business enterprises.

SYSTEM ACCESS

1. Provide 2,955 BART-owned parking spaces at existing rail stations and planned future station sites.
2. Seek to acquire land required for surface parking projects on Bond listing projects.

FIGURE 2: BART PERFORMANCE OBJECTIVES FOR FY 1986/87 (Cont'd.)

SYSTEM ACCESS (Cont'd.)

3. Continue to implement schedule coordination between BART and AC Transit.
4. Implement first stage streamlining in the West Corridor.
5. Implement Express Bus/Rail ticket.
6. Implement AC/BART joint ticket.
7. Initiate installation of Phase II of the elevator improvements.
8. Complete evaluation of platform edge project and seek funds for systemwide installation if appropriate.

JOINT DEVELOPMENT

1. Complete station area plans at Fremont and Concord.
2. Assuming local government interest and cooperation, initiate station area planning at two of the following stations:

El Cerrito Plaza	Orinda	Union City
El Cerrito del Norte	Lafayette	Hayward
Coliseum/Oakland Airport		
3. Continue "anchor tenant" and master developer marketing efforts focusing on Pleasant Hill, Concord, and Lake Merritt.
4. Assuming favorable market conditions, negotiate an acceptable ground lease agreement at at least one of the above sites.
5. Negotiate an acceptable special entrance agreement for the Fifth and Market project at Powell Street.
6. Seek to develop additional special entrances.

EXTENSIONS

1. Assist the Metropolitan Transportation Commission and SCCTD in completing the Preliminary Draft Alternatives Analysis/Draft Environmental Impact Document for the Fremont-South Bay Corridor by June 30, 1987.
2. Pursue acquisition of all sites as identified in the Extension Right-of-Way and Facilities Expenditures program within available funding by June 30, 1987.
3. Complete the Preliminary Draft Alternatives Analysis/Draft Environmental Impact Document for the Pittsburg-Antioch Corridor by June 30, 1987.

Figure 3: BART PERFORMANCE OBJECTIVES FOR FY 1987/88 THROUGH 1990/91

BASIC SYSTEM SERVICE AND CAPACITY

- o Operate 4-route weekday service with the capability of providing sustained 3 minute 10 second-headways by September 1988 following the completion of the Daly City Turnback reducing to 2 minutes 30 seconds by September 1989 following the completion of remaining capacity expansion projects.
- o Support the following weekday car requirements (as of the fourth quarter of each fiscal year):

<u>Service Requirements</u>	1988	1989	1990	1991
A-Cars	112	114	114	114
B-Cars	270	270	270	270
C-Cars	41	119	128	128
TOTAL	423	503	512	512

<u>Service Distribution</u>	1988	1989	1990	1991
On-Line	383	446	450	450
Spares	40	57	62	62
TOTAL	423	503	512	512

<u>Total Fleet</u>	1988	1989	1990	1991
A-Cars	135	135	135	135
B-Cars	300	300	300	300
C-Cars	48	585	585	585
TOTAL	483	585	585	585

RELIABILITY

- o At a minimum, maintain current reliability objective level performance under higher density train operations pending additional improvements which may be identified by the System Performance Study.

SAFETY AND SECURITY

- o Maintain a rate of patron-related crime below those for District communities and other transit systems in the Bay Area and in other metropolitan areas.

PATRONAGE AND TRAVEL PROMOTION

- o Maintain acceptable quality of service as reflected by accuracy of service announcements, employee helpfulness, and station cleanliness in support of achieving the following patronage levels (in 1000's):

	<u>FY 87/88</u>	<u>FY 88/89</u>	<u>FY 89/90</u>	<u>FY 90/91</u>
Average Weekday:	214.8	218.5	227.2	237.0
4-Hour Peak:	106.0	108.1	115.3	120.4
Offpeak:	108.8	110.4	111.9	116.6
Saturday:	94.8	98.5	102.1	108.8
Sunday:	51.9	52.5	53.3	55.3

- o In addition to FY 1986/87 ticket outlets, increase tickets-to-go outlets by 25 each fiscal year.

Figure 3: BART PERFORMANCE OBJECTIVES FOR FY 1987/88 THROUGH 1990/91 (cont'd.)

FINANCIAL & OPERATIONAL EFFICIENCY

- o Continue to provide cost-effective and efficient service through the achievement of key financial and operational efficiency objectives.

AFFIRMATIVE ACTION

- o Seek to achieve District objectives for workforce representation of minorities and women for minority business enterprise contract activities.

SYSTEM ACCESS

- o Complete parking redesign and surface parking projects.
- o Complete parking facilities at Pleasant Hill.
- o Complete Daly City Intermodal Facility.
- o Complete freeway off-ramp bus stops and the Dublin, West Livermore, West Antioch, Antioch, Pittsburg and Hercules Park and Ride lots.
- o Implement second stage streamlining in all Express Bus corridors.
- o Complete installation of Phase II of the self-operation elevator control improvements.
- o Complete installation of the platform edge project.

JOINT DEVELOPMENT

- o Continue station area planning efforts in preparation for marketing specific sites for development.
- o Market specific sites as market conditions and local plans permit.

EXTENSIONS

- o Continue to implement the Extension Right-of-Way Acquisition Program.
- o Complete the Alternatives Analysis and Final Environmental Impact Requirements for Phase I of the BART Extension Staging Policy.

FIGURE 4

BART CAPACITY EXPANSION PROGRAM *

4/1/86

MINIMUM HEADWAY CAPABILITY (MIN:SEC)	PROJECTS REQUIRED TO ACHIEVE OR SUPPORT THIS HEADWAY	ANTICIPATED PROJECT COMPLETION DATES	TARGET EXPANDED SERVICE START DATES	PEAK HOUR TRAINS PEAK DIRECTION TRANSBAY	PEAK PERIOD CAPACITY ON-LINE TRAINS	SPARE CARS	TOTAL CARS REQUIRED	AVAILABLE FLEET A/C-CARS 88% B-CARS 89% (EXTRA)	OPERATING FLEET SIZE
3:45	CURRENT SERVICE	---	JUL 80	16	43	A 86 B 235 T 321	16 24 361	108 (+6) 261 (+8) 369 (+8)	128 298 418D
3:30	KE TRACK	MAR 86	1)						
	FIRE HARDENING (CARS COMPLETED)	OCT 86	JAN 87	17	45	A 90 B 246 T 336E	16 24 376	114 (+8) 270 384 (+8)	135 300 435F
	DELIVERY OF 48 C-CARS	SEP 87	2)			A 96 C 41 B 246 T 383G	16 0 24 40	114 (+2) 41 270 425 (+2)	135 48 300 483F
3:10	FIRE HARDENING (REMOVAL OF VENT SEPARATION)	OCT 87	3)						
	ICS	OCT 87							
	DALY CITY TURNBACK	DEC 87							
	ELECT. CAPACITY INCREASE: INSTALL 3RD RAIL & YARD FEEDER	APR 88				A 108 C 92H B 4461	6 27 24 57	114 119 270 503	135 150 300 585F
	DELIVERY OF 102 ADDITIONAL C-CARS (150-TOTAL)	SEP 88	JAN 89	19	54H				
2:30	DALY CITY YARD	MAR 88	4)						
	NEW ON-BOARD ATC (A-CAR RETROFIT)	JUL 88							
	M-87 INTERLOCKING	JUL 88							
	ELECT. CAPACITY INCREASE: PROCURE & INSTALL SUB-STATION	MAR 89				A 114 C 90 B 246 T 450J	0 38 24 62	114 114 228 512	135 150 300 585F
	WAYSIDE TRAIN CONTROL/SYSTEM PERFORMANCE MODS	JUL 89	SEP 89	24	57				
2:15	BRAKE RATE ALGO-RITHM MODIFICATIONS	TBD	5) TBD	26					

* Footnotes to table appear on following page.

FOOTNOTES TO CAPACITY EXPANSION PROGRAM TABLES

- d Status as of December 1985.
- e With completion of firehardening, add 15 cars on-line (4 A's, 11 B's); 2 new consists (1-10 & 1-5).
- f Assumes 3 B's and 1 A on average will not be in operating fleet while awaiting repair of accident damage.
- g With first set of C-Cars, add 47 cars on-line (41 C's, 6 A's); 26 cars on 3 new consists (2-10's & 1-6) plus 21 cars to other trains.
- h Includes 2 extra 10-car trains required for operation of Daly City Turnback (prior to system resignaling) which do not increase actual capacity during regular peak cycle.
- i 3:10 headway permits addition of 6 consists (5-10's & 1-5) and 8 cars to other consists; 63 cars on new and existing consists (including 2-10's required for Daly City Turnback) plus 17 cars to spares.
- j 2:30 headway permits increase of on-line capacity of 5 consists; 25 additional cars on-line (note: requires further increase in spares of 5 vehicles and assumes requirement for 2 trains in Daly City Turnback is offset through resignaling).

Figure 5

BART FIVE-YEAR OPERATING BUDGET PROJECTIONS SUMMARY

(\$ Millions)

	Est/Act 85/86	86/87	87/88	88/89	89/90	90/91
REVENUES						
Net Passenger Revenue	73.4	84.2	87.6	97.3	106.9	111.7
Other Operating Revenue	<u>9.1</u>	<u>7.8</u>	<u>7.3</u>	<u>6.8</u>	<u>6.6</u>	<u>6.2</u>
Total Net Operating Revenues	82.5	92.0	94.9	104.1	113.5	117.9
EXPENSES						
Net Labor	107.0	113.9	121.5	131.6	142.4	150.7
Electric Power	19.2	22.1	26.7	30.1	34.9	38.0
Purchased Transportation	13.2	15.4	16.2	17.0	17.8	18.7
Other Nonlabor	<u>21.9</u>	<u>23.0</u>	<u>24.4</u>	<u>25.9</u>	<u>27.9</u>	<u>29.4</u>
Total Operating Expenses	161.3	174.4	188.8	204.6	223.0	236.8
OPERATING DEFICIT	(78.8)	(82.4)	(93.9)	(100.5)	(109.5)	(118.9)
FINANCIAL ASSISTANCE						
Property & Sales Tax	90.6	95.6	101.3	107.4	113.9	120.7
TDA & STA	2.4	2.9	2.8	3.0	3.2	3.4
Debt Service Allocations	(12.4)	(13.8)	(13.8)	(15.7)	(15.8)	(15.9)
Capital & Other Allocations	<u>(1.8)</u>	<u>(4.5)</u>	<u>(4.6)</u>	<u>(4.7)</u>	<u>(4.9)</u>	<u>(5.1)</u>
Total Financial Assistance	78.8	80.2	85.7	90.0	96.4	103.1
NET FINANCIAL RESULT	0.0	(2.2)	(8.2)	(10.5)	(13.1)	(15.8)
FINANCIAL INDICATORS						
Rail Farebox Ratio	48.9%	52.3%	49.9%	50.8%	51.1%	50.3%
System Operating Ratio	51.1%	52.8%	50.3%	50.9%	50.9%	49.8%
Rail Cost Per Passenger Mile	19.5¢	20.5¢	21.5¢	22.9¢	24.2¢	24.6¢

Figure 6

FIVE-YEAR CAPITAL PROGRAM SUMMARY

Expenditures, Cash Flow Basis
(000)

	Prior* Years	Budgeted FY 86/87	Projected FY 87/88	Projected FY 88/89	Projected FY 89/90	Projected FY 90/91	Projected Within 5 Year	Cumulative Total
Vehicle Funded	33,734	57,113	137,819	16,524	0	0	0	245,190
Unfunded	0	0	0	17,726	0	0	0	17,726
Facilities, Mainline								
Funded	67,201	90,184	38,395	1,321	0	0	0	197,101
Unfunded	0	3,673	48,727	8,817	734	735	10,738	73,424
Facilities, Station & Access								
Funded	2,999	44,516	12,607	13,605	10,874	2,051	382	87,034
Unfunded	525	3,480	2,082	25,462	46,981	33,789	420	115,739
Facilities, Support								
Funded	27	610	0	0	0	0	0	637
Unfunded	0	0	84.1	0	0	0	0	84.1
Train Control								
Funded	22,575	15,545	4,089	158	0	0	0	42,367
Unfunded	0	246	5,040	2,777	212	0	0	8,275
AFC & Communication								
Funded	15,852	4,453	655	418	0	0	0	21,378
Unfunded	0	0	0	0	0	0	0	0
Electrification								
Funded	911	431	280	64	0	0	0	1,686
Unfunded	26	3,630	4,084	1,161	0	0	340	9,241
Procurements								
Funded	1,724	949	395	0	0	0	0	3,068
Unfunded	200	1,332	4,489	370	200	0	0	6,591
Other Categories								
Funded	17,750	16,496	22,961	10,931	11,270	14,895	0	94,303
Unfunded	0	833	417	0	0	0	0	1,250
ALL CATEGORIES								
Funded	162,773	230,297	217,201	43,021	22,144	16,946	382	692,764
Unfunded	751	13,194	65,680	56,313	48,127	34,524	11,498	230,087
GRAND TOTAL	163,524	243,491	282,881	99,334	70,271	51,470	11,880	922,851

* Prior Years Expenditures on Active Projects

Figure 7

FIVE-YEAR CAPITAL PROGRAM SUMMARY

Sources, Cash Flow Basis

(000)

	Prior* Years	Budgeted FY 86/87	Projected FY 87/88	Projected FY 88/89	Projected FY 89/90	Projected FY 90/91	Projected Within 5 Year	Cumulative Total
UMTA Funds								
Funded	90,755	100,008	72,900	4,186	0	0	0	267,849
Unfunded	601	10,435	47,568	29,830	5,855	1,034	11,007	106,350
State Funds								
Funded	18,974	27,968	14,285	794	0	0	0	62,021
Unfunded	4	527	3,340	792	0	0	54	4,717
Regional Funds								
Funded	9,408	5,146	7,445	205	0	0	0	22,204
Unfunded	146	637	13,409	272	40	0	13	14,517
BARTD Funds								
Funded	43,636	97,175	122,571	37,836	22,144	16,946	382	340,690
Unfunded	0	1,595	1,363	25,419	42,232	33,470	424	104,503
ALL SOURCES								
Funded	162,773	230,297	217,201	43,021	22,144	16,946	382	692,764
Unfunded	751	13,194	65,680	56,313	48,127	34,524	11,498	230,087
GRAND TOTAL	163,524	243,491	282,881	99,334	70,271	51,470	11,880	922,851

* Prior Years Expenditures on Active Projects

INTRODUCTION



BART BACKGROUND AND FIVE YEAR PLAN PURPOSE

The BART District was formed in 1957 by the State Legislature in response to Bay Area growth forecasts and related future transportation needs. Following the major construction program, initial revenue operations, starting in September 1972, brought to light a variety of unanticipated problems. Over the past several years, intensive efforts have been directed toward improving reliability, service quality and capacity. This process has produced a greater understanding of the system's problems, together with "fixes" which have significantly improved train service.

BART's Five Year Plan presents a strategy for continued progress towards achieving a greater share of the system's full potential through increased capacity and improved system performance. The plan is the result of an ongoing process involving the District Board of Directors and management for the purpose of identifying future capital and financial requirements.

The document is divided into three chapters. The first identifies key issues and assumptions either carried over from the previous planning cycle or those which have more recently emerged. These concerns are then incorporated into the performance evaluation and planned improvements portion of the plan which is presented in Chapter II. The District's policy framework, consisting of annually adopted program area objectives, provides the framework for this discussion. Chapter III then presents the District's financial plan for supporting the capital and operating improvements identified in the previous chapter.

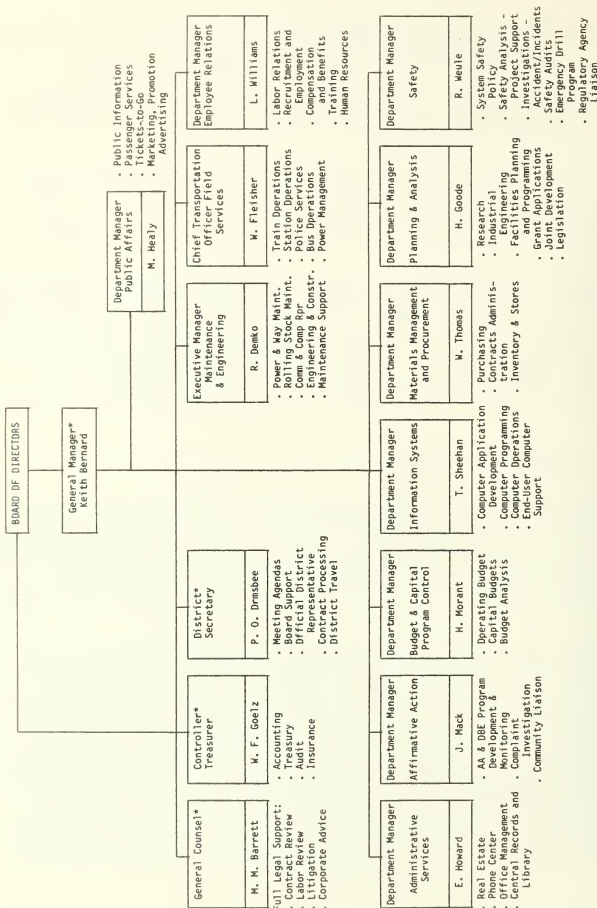
DISTRICT ORGANIZATIONAL OVERVIEW

Current BART organization reflects a management structure which has evolved over the past 11 years to carry out District programs and policies (see Figure i-1 on page ii). Fourteen department managers report directly to the General Manager who in turn reports to a nine-member elected Board. As Board appointed officers, three of the department managers also report directly to the Board of Directors. These are the General Counsel, Controller/Treasurer, and District Secretary.

As the legislative body of the District, the Board of Directors establishes BART policy. Each year the Board of Directors reviews and adopts a set of goals and program area performance objectives reflecting District needs. The goals are presented in Figure i-2 on page iii. This process is part of the annual budget and five-year planning cycle, and serves to guide management in budgeting for and organizing BART's labor force (consisting of approximately 2,300 employees) so that desired levels of performance may be achieved. Additionally, progress towards implementing important programs and capital improvements is continually monitored and reviewed. Other projects continue to be identified as part of this process in an effort to improve BART's effectiveness and operating performance even further. The Project Review Board, composed of key department managers, plays an important role in this process by recommending to the General Manager project priorities based on staff analysis and evaluation of District needs.

Figure i-1

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT



* Board Appointee

FIGURE i-2

BART GOALS FOR FY 1986/87

1. Operate scheduled 4-route weekday service with route headways of 15 minutes or less during peak and midday periods and expand service within feasible, technical, and financial limits including improved peak-hour frequency of service and capacity where needed.
2. Improve the reliability performance of the present BART system.
3. Continue to improve BART system and patron safety and emergency preparedness.
4. Increase system utilization by promoting BART travel for all purposes with special emphasis on offpeak and reverse commute trips.
5. Fund and implement the necessary capital improvements and replacements to the system.
6. Operate within available funds without incurring an unfunded deficit.
7. Maximize the contribution to operating costs from passenger revenues, consistent with reasonable fare levels, to achieve a farebox ratio above 50%.
8. Make every effort to achieve District objectives for female and minority employment and minority business enterprise participation.
9. Improve system access by means of a comprehensive program of parking expansion, BART feeder services, transit coordination, and special projects addressing elderly and handicapped mobility.
10. Develop station area sites for the realization of increased patronage and revenues, and to enhance the communities BART serves.
11. Extend BART trunk lines within Bay Area travel corridors where feasible and in support of regional land use policies.

SYSTEM OVERVIEW

The District currently operates trains over 71 miles of double mainline track, of which 20 miles are in subway, 24 miles are on elevated structures, and 27 miles are at grade. The system's 34 stations include 13 elevated, 14 subway, and 7 at grade which are spaced approximately 1/2 mile apart in downtown San Francisco and Oakland, and approximately 2 to 4 miles apart in suburban areas. Automatic fare collection equipment is located in each station to vend and process patron tickets. Free parking is provided at 23 stations in addition to one fee lot at Lake Merritt Station. Approximately 24,300 automobile spaces are provided systemwide.

Trains are from 3 to 10 cars in length and contain one control equipped vehicle (A-car) at each end with interior vehicles (B-cars) making up the remainder of each consist. All station platforms are approximately 700 feet long to accommodate maximum 10-car trains. As of December 1985, BART's vehicle fleet consists of 137 A-cars and 303 B-cars.

Trains are formed and dispatched from 3 maintenance yards in the Eastbay. The central train control computer at the Lake Merritt Administration Building maintains overall supervision of train movements. Operators onboard the leading A-car of each train have full voice communication with Central Control personnel and passengers onboard, and can override automatic controls should the need arise.

To date, approximately \$1.9 billion has been invested in system construction and equipment. This investment has been financed primarily through local sources including property and sales tax revenues generated within the three BART District counties.

CURRENT SERVICE OVERVIEW

Rail service is provide between the hours of 5 a.m. and 1:30 a.m. Monday through Friday, 5 a.m. to 1:30 a.m. on Saturdays, and 9 a.m. to 1:30 a.m. on Sundays and major holidays. Closings for individual stations are timed with the schedule for the last train beginning at approximately midnight. Service frequencies (in minutes) for individual routes and line segments are as follows:

	TRANSBAY ROUTES			EASTBAY Richmond/ Fremont	CBD LINE SEGMENT	
	Concord/ Daly City	Fremont/ Daly City	Richmond/ Daly City		San Francisco	Downtown Oakland
WEEKDAY						
Peak Hour	7.5	15	15	15	3.8	3.8
Midday	15	15	15	15	5	5
Night	20	*	*	20	20	10
SATURDAY						
Daytime	20	20	20	20	6.7	6.7
Night	20	*	*	20	20	10
SUNDAY/HOLIDAY						
All Day	20	*	*	20	20	10
*Requires transfer between Concord/Daly City and Richmond/Fremont routes						

The District also provides express bus service within major travel corridors not served by rail in both Alameda and Contra Costa counties. Bus service frequencies are as follows:

	Eastern Contra Costa	Western Contra Costa	Central Contra Costa-Alameda	Eastern Alameda
WEEKDAY				
Peak Hour	15	30	30	30
Midday	30	30	30	30
Night	60	60	60	60
SATURDAY				
Daytime	60	30	45	30
Night	60	60	60	60
SUNDAY/HOLIDAY				
All Day	60	*	60	60

* No service during this time period.

Trains can travel up to 80 miles per hour. Normal operations are based on a 70 mile per hour maximum which results in an average system speed of 32.7 miles per hour including station stops. Regular adult fares and travel times for the rail system are as follows:

Time	Fares	
	Day City	Suburban Park
1	1.30	1.30
2	1.30	1.30
3	1.30	1.30
4	1.30	1.30
5	1.30	1.30
6	1.30	1.30
7	1.30	1.30
8	1.30	1.30
9	1.30	1.30
10	1.30	1.30
11	1.30	1.30
12	1.30	1.30
13	1.30	1.30
14	1.30	1.30
15	1.30	1.30
16	1.30	1.30
17	1.30	1.30
18	1.30	1.30
19	1.30	1.30
20	1.30	1.30
21	1.30	1.30
22	1.30	1.30
23	1.30	1.30
24	1.30	1.30
25	1.30	1.30
26	1.30	1.30
27	1.30	1.30
28	1.30	1.30
29	1.30	1.30
30	1.30	1.30
31	1.30	1.30
32	1.30	1.30
33	1.30	1.30
34	1.30	1.30
35	1.30	1.30
36	1.30	1.30
37	1.30	1.30
38	1.30	1.30
39	1.30	1.30
40	1.30	1.30
41	1.30	1.30
42	1.30	1.30
43	1.30	1.30
44	1.30	1.30
45	1.30	1.30
46	1.30	1.30
47	1.30	1.30
48	1.30	1.30
49	1.30	1.30
50	1.30	1.30
51	1.30	1.30
52	1.30	1.30
53	1.30	1.30
54	1.30	1.30
55	1.30	1.30
56	1.30	1.30
57	1.30	1.30
58	1.30	1.30
59	1.30	1.30
60	1.30	1.30

A 6.25% rail fare discount is provided through the sale of \$32 tickets for \$30. Free transfers can be made between all BART trains. Special agreements between BART and most other Bay Area operators permit up to a 50% discount for connecting transit service (on a round-trip basis). Additionally, a \$23 BART/MUNI monthly pass is also available, allowing for unlimited BART and San Francisco/MUNI travel within San Francisco.

Fares for handicapped persons, students 5-12 years of age, and persons 65 years of age and older are 10% of the regular adult fare. Children under 5 can ride free. Regular express bus fares are 75¢ and \$1.15 for one and two zone rides, respectively (with a free transfer worth 75¢ for BART patrons leaving a station). Discount bus fares are 15¢ for one zone and 30¢ for two zones for the special fare groups listed above.

BART FARE COMPONENTS AND TICKET PRICES (EFFECTIVE JANUARY 1986)		
TRIP LENGTH:	Up to 6 Miles	\$0.80
	Between 6 and 14 Miles ¹	\$0.92 + \$0.069/Mile
	Over 14 Miles	\$1.47 + \$0.041/Mile
SURCHARGE:	Transbay	\$0.45
	Daly City ²	\$0.52
SPEED PREMIUM:	Extra Charge for Faster (or fare reduction for slower) Than Average Trips; Based on Scheduled Travel Time	+/- \$0.025/Minute
RESULTING FARES: ³	Minimum	\$0.80
	Maximum	\$3.00
	Average ⁴	\$1.69
SPECIAL FARES ⁵	Children Under 5 (no charge)	\$0.00
TICKETS:	Children 5 to 12 (90% Discount)	\$1.20 (\$12.00 Value)
	Persons 65 and Over (90% Discount)	\$1.20 (\$12.00 Value)
	Qualifying Handicapped (90% Discount)	\$1.20 (\$12.00 Value)
	Regular Adult (4.8% Discount)	\$20.00 (\$21.00 Value)
	Regular Adult (6.25% Discount)	\$30.00 (\$32.00 Value)
	Excursion (Entry/Exit, Same Station)	\$2.60
MONTHLY PASS: ⁶	Unlimited BART/MUNI Travel Within San Francisco	\$23.00
EXPRESS BUS:	Children Under 5 (No Charge)	\$0.00
(1 Zone/2 Zone)	Children 5-12	\$0.15/\$0.30
	Regular Adult	\$0.75/\$1.15
	Persons 65 and Over	\$0.15/\$0.30
	Qualifying Handicapped	\$0.15/\$0.30
TRANSFERS:	BART Express Bus (Leaving Rail Station)	\$0.75 Value
	SF MUNI (Per Muni Round Trip)	\$0.75 Value
	AC Transit (Per AC Round Trip) -- Peak ⁷	\$0.30 Value
	Off-Peak	\$0.70 Value

- Trips over 6 miles within Eastbay Suburban Zone (Concord-Orinda, Fremont-Bayfair, Richmond-Ashby) priced at fare indicated for trips under 6 miles.
- Does not apply to Transbay trips.
- Resulting fares are rounded to nearest 5¢ and encoded in Automatic Fare Collection equipment.
- Weighted by all BART-ticketed trips (excludes BART/MUNI pass trips) which average 13.9 miles.
- Discounted multiple-ride tickets are sold at BART ticket outlets and are not available in stations.
- The Joint BART/MUNI pass is available at all San Francisco MUNI pass outlets.
- Weekdays 6 AM - 9 AM and 4 PM - 7 PM.

CHAPTER I

PLANNING ISSUES



The five main issues identified previously in the Short Range Transit Plan will continue to figure prominently in District planning considerations for the foreseeable future. These five issues are:

- o Future Demand Projections
- o New Peak Service Capacity and Demand
- o Service Quality
- o Cost Effectiveness and Productivity
- o Program Delivery

The following issues have gained new prominence recently, or reflect newly defined "emphasis areas" designated by the Urban Mass Transportation Administration:

- o System Extensions
- o Maintenance Requirements
- o Express Bus Effectiveness and Productivity
- o Energy Contingency Requirements
- o Capital Investment Planning
- o Privatization
- o Disadvantaged Business Enterprise
- o Short Range Transit Planning

In the following sections of this chapter, each of these issues will be reexamined in terms of the latest available projections, assumptions, or related information. Based on this general discussion, the plan will focus in the next chapter on a detailed assessment of District functions by program area.

FUTURE DEMAND PROJECTIONS

Expectations regarding future ridership levels are perhaps the key consideration in transit short- and long-range planning. Additional emphasis is given to anticipated peak period riding as the determinant of maximum system capacity requirements. Route-by-route growth patterns will influence the distribution of available capacity, and underscore the need for capital improvements. Patronage projections affect staffing and other resource allocation, especially for vehicle maintenance and power requirements. Taken together with estimates of available financial assistance, annual ridership and revenue projections largely determine future expenditure limits. Future demand assessment is, therefore, the starting point in the Five Year Plan process.

What is the outlook for growth of BART patronage during the upcoming planning period? Existing BART capacity can be utilized more intensively during offpeak periods. However, the system appears to have reached saturation at existing capacity during commute periods.

This section is comprised of three parts: a brief discussion of recent trends and their application to this update, a description of the forecast methodology and step-by-step summary of the forecast, and the resulting implications of the updated forecast vis-a-vis the previous set of projections.

RECENT TRENDS

Growth of BART ridership slowed abruptly during the most recent two quarters ending October-December 1985. In order to observe meaningful trends, non-comparable periods have been excluded in the analysis which follows. In the past, the analysis has focused on trends since the previous fare increase. Although the last BART fare increase occurred in September 1982, the BART/MUNI Fast Pass was introduced in April 1983, prompting a significant increase in patronage. Therefore, this analysis focuses on trends since April 1983 so as to exclude the transition to higher trip making with the Fast Pass during its first year.

The first year of the analysis is April 1983-March 1984. The second year is April 1984-March 1985. The first nine months of the third year, April 1985-December 1985, have also been analyzed.

Because growth rates differ between weekdays and weekends, and holidays and partial holidays are not observed similarly in each quarter, the weekly rate reflecting 5 weekdays plus a weekend is probably the best single indicator of patronage growth. On an average weekly basis, ridership in the second twelve month period following the introduction of the Fast Pass increased 5.7% over that of the prior 12 months. This growth rate is comparable to the long-run compound average annual rate of increase in BART trips observed since the start of Transbay service in 1974 (5.9%).

In contrast, the annual rate of increase in weekly trips during the first three quarters of the third year of the Fast Pass program was only 2.4%. Whether this is a temporary aberration, a reflection of the decreases in gasoline prices (which began in 1981 and continued during the period), or an indication of the impact of BART service disruptions during the most recent two quarters, a projection of future ridership for budget purposes should recognize this leveling off of growth.

The remainder of this section examines patronage trends by day of week and, on weekdays, by time of day. The purpose of this analysis is to identify trends to be utilized in projecting future growth.

Disaggregation of the data by day of week reveals some interesting differences in growth rates, with reduced rates in all three periods. These are as follows:

	<u>Weekdays</u>	<u>Saturdays</u>	<u>Sundays</u>	<u>Weekly</u>
2nd Year Increase ¹	5.2%	9.2%	10.8%	5.7%
3rd Year Increase ²	2.0%	6.6%	3.9%	2.4%

Annual increases in weekday, Saturday and Sunday travel by quarter are summarized in Table I-1 for the past three and one-half fiscal years. Note that

-
- ¹ Over the first 12 months of the Fast Pass Program, i.e., Apr 84-Mar 85 vs. Apr 83-Mar 84.
 - ² First nine months vis-a-vis the comparable period a year earlier, i.e., Apr-Dec 85 vs. Apr-Dec 84.

TABLE I-1

QUARTERLY AVERAGE DAILY AND WEEKLY PATRONAGE
AND ANNUAL PERCENTAGE GROWTH RATES SINCE JULY-SEPTEMBER 1982
(Trips in Thousands)

	Weekdays		Saturdays		Sundays		Weekly	
	Average Weekday	Annual Growth	Average Saturday	Annual Growth	Average Sunday	Annual Growth	Average Per Week	Annual Growth
July-September 1982	188.7		73.5		48.3		1,065.3	
October-December 1982	181.4		72.8		40.7		1,020.5	
January-March 1983	183.6		67.1		38.5		1,023.6	
BART/MUNI Fast Pass: 4/83								
April-June 1983	191.4		72.8		46.1		1,075.9	
July-September 1983	196.3	4.0%	79.8	8.6%	45.0	-6.8%	1,106.3	3.8%
October-December 1983	203.5	12.2%	77.0	5.8%	43.6	7.1%	1,138.1	11.5%
January-March 1984	205.2	11.8%	80.9	20.6%	43.9	14.0%	1,150.8	12.4%
Average: 1st Year, Fast Pass	199.1		77.6		44.7		1,117.8	
April-June 1984	205.2	7.2%	82.0	12.6%	49.2	6.7%	1,157.2	7.6%
July-September 1984	211.0	7.5%	83.5	4.6%	51.4	14.2%	1,189.9	7.6%
October-December 1984	210.0	3.2%	87.1	13.1%	49.3	13.1%	1,186.4	4.2%
January-March 1985	211.5	3.1%	86.5	6.9%	48.0	9.3%	1,192.0	3.6%
Average: 2nd Year, Fast Pass	209.4	5.2%	84.8	9.2%	49.5	10.8%	1,181.4	5.7%
April-June 1985	213.8	4.2%	88.7	8.2%	55.1	12.0%	1,212.8	4.8%
July-September 1985	214.8	1.8%	87.6	4.9%	52.9	2.9%	1,214.5	2.1%
October-December 1985	210.1	0.0%	92.9	6.7%	47.8	-3.0%	1,191.2	0.4%
Average: 3rd Year, Fast Pass	212.9	2.0%	89.7	6.6%	51.9	3.9%	1,206.2	2.4%

the most recent quarterly rates have dipped below the third year rates indicated above, with no growth in weekday trips versus the same period a year before, and a decline in Sunday ridership.

In the analysis which follows, weekday trips are grouped into three categories:

Offpeak
Peak 4 Hours:
Peak Load Point
Remainder

For weekdays, offpeak growth differs from that of the peak four hour period:

	<u>Offpeak</u>	<u>Peak 4 Hours</u>
2nd Year Increase ¹	9.3%	1.5%
3rd Year Increase ²	4.1%	-0.1%

Growth of ridership in the offpeak periods (weekdays and weekends) has significantly exceeded the peak period rate of increase during the last two years when BART peak capacity has been constrained. This finding underscores the near-term value of the BART Marketing Program, which focuses on increasing offpeak riding, before elements of the Capacity Expansion Program are implemented.

Within the peak period, growth rates differed between those trips which pass through the peak load point on each of the four routes and the remaining peak period trips. In this analysis, peak load point trips are those flowing in the peak direction measured at the busiest point on each route during the peak cycle when all trains on the system pass a given point. (This cycle is monitored regularly for the PM peak in the Quarterly Performance Report and is about 25 minutes longer than the 2-hour PM peak during which all system exits have historically been monitored. For this analysis, the PM peak figures have been doubled to approximate the daily peak load point volumes, after adjusting the peak cycle figures to a 2-hour rate. The remaining trips result from subtracting the peak load point trips from the 4-hour peak total.)

	<u>Peak Load Point</u>	<u>Remainder</u>
2nd Year Increase ¹	2.2%	0.6%
3rd Year Increase ²	-0.5%	0.4%

Annual increases by quarter are summarized for weekdays by time of day in Table I-2. Generally, the most recent rates are the lowest. The sample data indicate a flattening out of peak load point growth. However, this finding

¹ Over the first 12 months of the Fast Pass program, i.e., Apr 84-Mar 85 vs. Apr 83-Mar 84.

² First nine months vis-a-vis the comparable period a year earlier, i.e., Apr-Dec 85 vs. Apr-Dec 84.

TABLE I-2
QUARTERLY AVERAGE WEEKDAY PATRONAGE BY TIME OF DAY
AND ANNUAL PERCENTAGE GROWTH RATES SINCE JULY-SEPTEMBER 1982
(Trips in Thousands)

	PEAK 4 HOURS PEAK LOAD POINT	GROWTH RATE	PEAK 4 HOURS REMAINDER	GROWTH RATE	PEAK 4 HOURS TOTAL	GROWTH RATE	OFFPEAK	GROWTH RATE
July-September 1982	53.8		39.8		93.6		95.1	
October-December 1982	52.5		40.3		92.8		88.6	
January-March 1983	53.3		42.7		96.0		87.6	
BART/MUNI Fast Pass: 4/83								
April-June 1983	53.9		49.7		103.6		87.7	
July-September 1983	54.0	0.4%	45.3	13.8%	99.3	6.1%	97.0	2.0%
October-December 1983	56.5	7.6%	49.2	22.1%	105.7	13.9%	97.8	10.4%
January-March 1984	58.2	9.2%	50.2	17.6%	108.4	12.9%	96.7	10.4%
Average: 1st Year, Fast Pass								
	55.7		48.6		104.3		94.8	
April-June 1984	55.1	2.2%	51.7	4.0%	106.8	3.1%	98.4	12.2%
July-September 1984	56.3	4.3%	46.7	3.1%	103.0	3.7%	108.0	11.3%
October-December 1984	58.2	3.0%	46.6	-5.3%	104.8	-0.9%	105.1	7.5%
January-March 1985	58.0	-0.3%	50.6	0.8%	108.6	0.2%	102.9	6.4%
Average: 2nd Year, Fast Pass								
	56.9	2.2%	48.9	0.6%	105.8	1.5%	103.6	9.3%
April-June 1985	57.1	3.6%	48.3	-6.6%	105.4	-1.3%	108.4	10.2%
July-September 1985	56.1	-0.4%	47.8	2.4%	103.9	0.9%	111.0	2.8%
October-December 1985	55.6	-4.5%	49.5	6.2%	105.1	0.3%	105.0	-0.1%
Average: 3rd Year, Fast Pass								
	56.3	-0.5%	48.5	0.4%	104.8	-0.1%	108.1	4.1%

must be considered preliminary and subject to further confirmation because of possible sample limitations.

Perhaps the most significant recent development in BART ridership trends is the apparent leveling off of the remaining trips during the peak four hours. This development represents a major change from prior trends. In the previous plan, growth of this market segment was determined to be well above the weekday average. Based on excess capacity within San Francisco and elsewhere on the system, it was assumed that this segment was not constrained and would continue to grow despite capacity constraint through the peak load points. Since this segment accounts for 46% of the peak four hour demand, this leveling off, when incorporated into the revised future projections, will account for most of the difference between current and prior BART patronage forecasts.

The trends suggested by the growth rates reported in the Tables I-1 and I-2 are lower (conservative) than those previously observed and used as the basis for prior year forecasts. However, because the significant slowdown (as measured by a weekly annual growth rate of less than 3.5%) has only occurred during the past two quarters, it is probably too soon to conclude that lower growth rates of BART travel except during the congested peak period are a confirmed pattern.

If the last quarter is considered an aberration to be excluded from the average of the last three quarters, the growth rates are somewhat higher, as follows:

	<u>Last 3 Quarters</u> <u>(April-Dec. 1985)</u>	<u>Prior 2 Quarters</u> <u>(April-Sept. 1985)</u>
Weekdays	2.0%	3.0%
Peak 4 Hours	-0.1%	-0.2%
Peak Load Point	-0.5%	1.6%
Remainder	0.4%	-2.3%
Offpeak	4.1%	6.3%
Saturdays	6.6%	6.5%
Sundays	3.9%	7.4%

Given the variation in rates just indicated, and the uncertainty about future trends, especially in view of the possibility of continuing erosion of world oil prices, it seems reasonable to define an upper and lower set of growth rates for forecast purposes.

FORECAST METHODOLOGY AND PROJECTIONS

In the absence of a workable regional travel demand model which can accurately project submodal splits (transit travel by BART vs. bus) reliance continues to be placed primarily on a trend-based forecast methodology for updating BART travel demand during the next five-year period. The January 1986 fare

increase presents an added uncertainty to the analysis in that it is too soon to fully verify the accuracy of projected ridership decreases and the ensuing trend.

The forecast methodology involves three steps:

1. Projections are made at 1985 fare levels first. This step applies to all but the peak load point estimates. Projections are based on the appropriate recently observed trend rates. These rates are assumed to continue through time based on performance to date and the expectation that BART parking capacity and other means of access will be improved during the planning period.

For weekday offpeak and Sunday, the rates for the last three quarters (4.1% and 3.9%) are proposed for the lower growth set, and the higher growth set would be defined by the prior two quarters (6.3% and 7.4%). Saturday rates would be the same for each set, at 6.5% annually. For the remaining trips during the peak four hours, it is proposed that the rate observed on average over the last three quarters (0.4%) be utilized for both sets, given the recent fluctuation of these rates and the unlikely prospect of negative growth in the peak period when BART is most competitive.

Future patronage projections for all segments except new weekday peak load point trips are shown in Table I-3 by fiscal year through 90/91. Note that, in effect, existing peak load point demand is assumed to remain unchanged in this tabulation. Not all routes are constrained during the peak period, but additional growth accommodated by existing capacity is estimated in conjunction with the projected response to future capacity increases discussed under Step 2 below. Estimates reflect both the "low" and "high" growth assumptions described above. Total annual ridership without the new weekday peak direction trips averages 2.6% to 2.8% annually with the "low" growth assumptions, and 3.8% to 4.1% per year with the "high" growth assumptions.

2. Weekday peak load point demand is next projected by route using a growth model which relates anticipated load factors to subsequent rates of increase in patronage. This process projects the demand response to increases in the peak direction capacity as cars and trains are added in the future, based on an evaluation of demand/capacity conditions by route. This model is based on the observed relationship between peak period load factors and the average annual increase in demand by route since the September 1982 fare increase (note that the maximum load points on each of the four routes are not in San Francisco and therefore are not affected by Fast Pass Travel).

The load factor-growth rate model was discussed in the previous five-year plan and has been updated for application in this analysis. This model is shown graphically in Figure I-1. For each route, the load factor at existing capacity is calculated for the base year and a corresponding growth rate is determined from the model. If no capacity increase is programmed for the route, the next year's incremental ridership increase is determined by the growth factor. With no increase in capacity, the load factor increases and the next year's growth factor diminishes, in some cases (when the capacity constrained load factor is reached) to a point of no growth.

Table I-3

PATRANCE FORECAST FOR 1986 FIVE-YEAR PLAN UPDATE
BASED ON "LOW" AND "HIGH" GROWTH ASSUMPTIONS
(All Segments Except "Peak Load Point")

	FY 84/85 ACTUAL	ESTIMATED % CHANGE	FY 85/86 ESTIMATED	ASSIGNED ANNUAL GROWTH RATE	FY 86/87 PROJECTED	FY 87/88 PROJECTED	FY 88/89 PROJECTED	FY 89/90 PROJECTED	FY 90/91 PROJECTED
PATRANCE AT 1985 FARES: 'LOW' GROWTH									
PEAK LOAD POINT, WEEKDAYS At Current Capacity	57.4	-2.4%	56.0		56.0	56.0	56.0	56.0	56.0
Subtotal, Peak Direction Response to New Service	57.4		56.0		56.0	56.0	56.0	56.0	56.0
NON-PEAK DIRECTION, DAILY									
Remaining Weekday Peak Period	48.1	0.4%	48.3	1.004	48.5	48.7	48.9	49.1	49.3
Subtotal, Peak Period	105.5	-1.1%	104.3		104.5	104.7	104.9	105.1	105.3
Remaining Weekday Peak Period	106.2	4.1%	110.6	1.041	115.1	119.9	124.8	129.9	135.2
Subtotal, Peak Four Hours	211.7	1.5%	214.9		219.6	224.5	229.7	235.0	240.5
Weekday Offpeak	86.5	6.5%	92.1	1.065	98.1	104.5	111.3	118.5	126.2
Subtotal, Average Weekday									
Saturday	51.0	3.9%	53.0	1.039	55.1	57.2	59.4	61.8	64.2
Sunday									
WEEKLY (5 Weekdays Plus Weekend)	1,196.0	2.0%	1,219.6		1,251.3	1,284.4	1,319.0	1,355.1	1,392.8
ANNUAL TOTAL	61,345.2	2.0%	62,559.6		64,188.7	65,890.0	67,667.0	69,523.2	71,462.5
PERCENTAGE INCREASE OVER PRIOR YEAR					2.6%	2.7%	2.7%	2.7%	2.8%

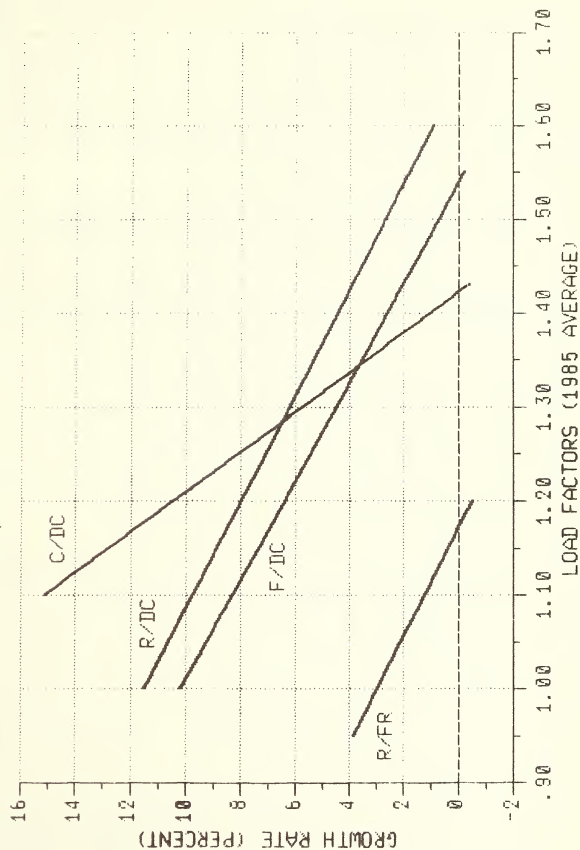
PATRANCE AT 1985 FARES: 'HIGH' GROWTH

PEAK LOAD POINT, WEEKDAYS At Current Capacity	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
Subtotal, Peak Direction Response to New Service	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
NON-PEAK DIRECTION, DAILY									
Remaining Weekday Peak Period	48.3	48.5	48.7	1.004	48.9	49.1	49.3	49.5	49.7
Subtotal, Peak Period	104.3	104.5	104.7		104.9	105.1	105.3	105.5	105.7
Remaining Weekday Peak Period	110.6	117.6	122.1	1.063	127.7	132.8	138.0	143.2	148.4
Subtotal, Peak Four Hours	214.9	222.1	229.7		237.7	246.3	255.4	264.5	274.0
Weekday Offpeak	92.1	98.1	104.5	1.065	111.3	118.5	126.2	134.0	141.8
Subtotal, Average Weekday									
Saturday	53.0	56.9	61.1	1.074	65.7	70.5	75.7	81.0	86.3
Sunday									
WEEKLY (5 Weekdays Plus Weekend)	1,219.6	1,265.3	1,313.9		1,365.6	1,420.5	1,478.9	1,539.1	1,599.3
ANNUAL TOTAL	62,559.6	64,906.1	67,404.4		70,086.2	72,879.5	75,879.1	79,079.1	82,479.1
PERCENTAGE INCREASE OVER PRIOR YEAR		3.8%	3.8%		3.9%	4.0%	4.1%	4.2%	4.3%
DIFFERENCE BETWEEN 'HIGH' AND 'LOW'									
Subtotal, Peak Direction Response to New Service									
Remaining Weekday Peak Period									
Subtotal, Peak Period									
Remaining Weekday Peak Period									
Subtotal, Peak Four Hours									
Weekday Offpeak									
Subtotal, Average Weekday									
Saturday									
Sunday									
WEEKLY (5 Weekdays Plus Weekend)									
ANNUAL TOTAL									
PERCENTAGE INCREASE OVER PRIOR YEAR									
DIFFERENCE BETWEEN 'HIGH' AND 'LOW'									

FIGURE I-1

LOAD FACTOR GROWTH RATE MODEL

Based on Compound Growth 1982-1985



Because peak load point capacity is constrained, the interaction between the January 1986 fare increase, and resulting patronage loss and lower load factors need to be examined systematically beginning with the projected impact of the fare increase. This analysis is summarized in Table I-4. The FY 85/86 estimates reflect the projected impact of the January 1986 fare increase. Note that, with the ridership reduction following the fare increase, the peak hour load factors are reduced on the two most heavily travelled routes (Concord and Fremont/Daly City) in comparison with the FY 84/85 levels. (Demand and load factors on the other, unconstrained routes are higher than FY 84/85 levels after the fare increase because projected year-to-year growth rates exceed the anticipated erosion due to the fare increase.)

A planned increase in capacity lowers the load factor and raises the growth projection for the next year. Where demand has been constrained for more than one year (thereby effectively halting any further growth in ridership), new capacity is assumed to be met with an instantaneous demand response equivalent to the number of new seats added. This is projected for both the Concord and Fremont/Daly City routes in the peak hour. In addition to this "backlog" effect, the new capacity and resulting load factor produce a growth response as well during the following year. The results of this process are shown in detail in Table I-4 for the PM peak cycle. The capacity increases assumed in this analysis are generally as shown in the 1985 Five Year Plan, and are discussed in more detail below.

For purposes of estimating systemwide demand, the PM peak projections reflected in Table I-4 have been expanded to represent both peak periods by assuming that the AM peak cycle is the mirror image of the PM peak. In addition, the increments have been converted to annualized average daily estimates (where the backlog effect is for less than the full year). These projections are summarized in Table I-5.

3. The 1985 fare level projections shown in Table I-3, for all segments except the peak load point trips, are next factored down by the expected shrinkage (based on the assumed elasticity of demand) resulting from the most recent fare increase, and subsequently for the increase planned in 1989. The "low" and "high" estimates are summarized in Tables I-6 and I-8, respectively. These estimates include the projected peak load point trips at the appropriate fare level.

The projections were adjusted for the 1986 and 1989 fare increases targeted in the 1985 Five-Year Plan of 30% in January 1986 and 15% in January 1989. The "low" patronage projections are summarized in Tables I-6 and I-7, and the "high" estimates in Tables I-8 and I-9. These estimates assume demand elasticities of -0.15 in the peak period and -0.37 in the offpeak.

IMPLICATIONS OF THE 1986 FORECAST

The five-year demand estimates summarized above are generally lower than the patronage forecast in the 1985 Five Year Plan and the preliminary estimates prepared earlier in the 1986 Plan update process. Virtually all of the variance from the previous estimates is explained by currently projected lower growth of ridership during the peak four-hour period. The new offpeak and weekend projections are comparable or slightly higher than the previous

Table I-4

PROJECTED RH PEAK LOAD POINT AVERAGE WEEKDAY FAIRFAXGROWTH
BY ROUTE AND TIME SEGMENT, FY 85/86 - FY 90/91
BASED ON UPDATED BART LOAD FACTOR - GROWTH RATE MODEL OF PEAK DEMAND

PEAK 60 MINUTES	FY 84/85	FY 85/86*	FY 86/87*	FY 87/88*	FY 88/89*	FY 89/90*	FY 90/91*
Concord/Daily City							
Load Factor	1.45	1.39	1.41	1.42	1.34	1.29	1.37
Growth Rate Over Prior Year	0.02	—	1.42	0.42	0.22	3.92	6.32
Increment		-259	92	33	594	281	472
Total Trips	6,718	6,459	6,551	6,584	7,178	7,459	7,931
Fremont/Daily City							
Load Factor	1.56	1.50	1.42	1.45	1.37	1.29	1.34
Growth Rate Over Prior Year	0.02	—	0.72	2.32	1.72	4.52	5.02
Increment	-189	754	754	126	697	196	322
Total Trips	4,902	4,713	5,467	5,593	6,290	6,486	6,806
Richmond/Daily City							
Load Factor	1.35	1.37	1.44	1.18	1.25	1.27	1.35
Growth Rate Over Prior Year	5.22	—	5.02	3.82	8.42	7.12	6.72
Increment	-34	2,944	147	117	197	242	265
Total Trips	2,910	2,944	3,091	3,208	3,405	3,647	3,892
Richmond/Front							
Load Factor	1.18	1.13	1.14	0.88	0.90	0.95	0.98
Growth Rate Over Prior Year	0.02	—	0.02	0.52	5.12	4.72	3.92
Increment	-64	10	10	8	48	78	69
Total Trips	1,661	1,597	1,607	1,615	1,663	1,741	1,810
BALANCE OF PEAK CYCLE							
Concord/Daily City							
Load Factor	1.30	1.32	1.28	1.10	1.12	1.26	1.36
Growth Rate Over Prior Year	5.22	—	5.02	6.82	15.22	14.42	7.52
Increment	65	289	289	414	832	1,050	626
Total Trips	5,709	5,774	6,063	6,477	7,309	8,359	8,985
Fremont/Daily City							
Load Factor	1.29	1.30	1.36	1.12	1.12	1.14	1.22
Growth Rate Over Prior Year	4.62	—	4.52	3.42	7.92	8.02	7.52
Increment	21	168	168	132	225	338	343
Total Trips	3,678	3,699	3,867	3,999	4,224	4,562	4,905
Richmond/Daily City							
Load Factor	1.22	1.26	1.35	1.10	1.11	1.12	1.22
Growth Rate Over Prior Year	7.62	—	6.82	5.32	9.72	9.62	9.42
Increment	105	214	214	178	261	362	388
Total Trips	3,033	3,138	3,352	3,530	3,791	4,153	4,541
Richmond/Fremont							
Load Factor	1.08	1.04	1.07	1.09	1.08	1.10	1.11
Growth Rate Over Prior Year	0.62	—	2.22	1.82	1.52	1.62	1.52
Increment	-53	35	35	29	-10	26	21
Total Trips	1,618	1,565	1,600	1,629	1,619	1,645	1,666
TOTAL RH PEAK CYCLE							
Growth Rate Over Prior Year	-1.12	5.72	3.32	3.32	8.72	7.32	6.52
Increment	-340	1,709	1,037	1,037	2,844	2,573	2,486
Total Trips	30,229	29,889	31,596	32,635	35,479	38,052	40,536

* Adjusted for 30% fare increase effective January 1986. # Adjusted for proposed 15% fare increase January 1989.

TABLE I-5

SUMMARY OF PROJECTED PEAK LOAD POINT PATRONAGE GROWTH

	FY 86/87	FY 87/88	FY 88/89*	FY 88/89#	FY 89/90	FY 90/91
PM PEAK 60 MINUTES						
Response to Prior Year Load Factor						
Concord/Daly City	92	33	11	-137	281	472
Fremont/Daly City	34	126	95	-118	196	322
Richmond/Daly City	147	117	269	-72	242	245
Richmond/Fremont	10	8	83	-35	78	69
Backlog of Demand After Removal of Capacity Constraint						
Concord/Daly City			720	720		
Fremont/Daly City	720		720	720		
Subtotal, PM Peak 60 Minutes	1,003	284	1,898	1,078	797	1,108
BALANCE OF PM PEAK CYCLE						
Response to Prior Year Load Factor						
Concord/Daly City	289	414	987	-155	1,050	626
Fremont/Daly City	168	132	316	-90	338	343
Richmond/Daly City	214	178	341	-80	362	388
Richmond/Fremont	35	29	24	-34	26	21
Subtotal, Balance of PM Peak Cycle	706	753	1,668	-359	1,776	1,378
TOTAL, AM AND PM PEAK CYCLES						
Response to Prior Year Load Factor	1,978	2,074	4,252	-1,442	5,146	4,972
Backlog of Demand After Removal of Capacity Constraint	1,440	0	2,880	2,880	0	0
Total, AM & PM Peak Cycles	3,418	2,074	7,132	1,438	5,146	4,972
ANNUALIZED CUMMULATIVE INCREASE						
Response to Prior Year Load Factor						
FY 86/87	1,978	1,978	1,978	1,978	1,978	1,978
FY 87/88		1,901	2,074	2,074	2,074	2,074
FY 88/89, Before Fare Increase			2,835	2,835	4,252	4,252
FY 88/89, After Fare Increase				-1,442	-1,442	-1,442
FY 89/90					5,146	5,146
FY 90/91						4,972
Backlog of Demand After Removal of Capacity Constraint						
FY 86/87 @ 6/12'S Annual Average	720	1,440	1,440	1,440	1,440	1,440
FY 88/89 @ 1/12'S Annual Average			1,440	1,440	2,880	2,880
Annualized Total Increment	2,698	5,319	9,767	8,325	16,328	21,300

* Before proposed January 1989 fare increase.

After 15% fare increase.

Table 1-6

"LOA" PATRIMANCE FORECAST FOR 1966 FIVE YEAR PLAN UPDATE
(All Trips in Thousands)

FARE INCREASE RETENTION FACTOR	FY 84/85		FY 85/86		FY 86/87		FY 87/88	
	ACTUAL	WEEKLY	GROWTH FACTOR	DAILY INCREMENT	DAILY INCREMENT	WEEKLY INCREMENT	GROWTH FACTOR	DAILY INCREMENT
PATRIMANCE AT 1985 FARES								
PEAK LOAD POINT								
Weekdays, At Current Capacity	57.4	287.0	-2.42	56.0	-7.0			
Weekdays, Response to New Service	0.0	0.0		0.0	0.0			
Subtotal, Peak Direction	57.4	287.0		56.0	-7.0			
NON-PEAK DIRECTION								
Weekdays, Remaining Peak Period Trips	48.1	240.5	0.42	48.3	1.0			
Subtotal, Peak 4 hours	105.5	527.5		104.3	-6.0			
Weekdays, Offpeak (Midday & Evening)	106.2	530.9	4.22	110.6	22.1			
Subtotal, Average Weekday	211.7	1,058.4		214.9	16.1			
Saturday	86.5	86.5	6.52	92.1	5.6			
Sunday	51.0	51.0	4.02	53.0	2.0			
Subtotal, Non-Peak Direction	908.8			30.8				
Annual Total Patrimance at Current Fares	60,798			62,560	33.9			
NET RAIL REVENUE TOTAL	66,441			\$66,190	1,311.3			
Annual Total PASSENGER MILES	789,292			810,772	15,591.8			
PATRIMANCE AFTER 30% FARE INCREASE IN 1966								
PEAK LOAD POINT								
Weekdays, At Current Capacity	96.142		54.9	-6.9		53.8	-5.4	53.8
Weekdays, Response to New Service	96.142		0.0	0.0		2.7	13.5	5.5
Subtotal, Peak Direction			54.9	-6.9		56.5	8.1	59.3
NON-PEAK DIRECTION								
Weekdays, Remaining Peak Period Trips	96.142		47.4	1.0		46.6	-3.7	46.8
Subtotal, Peak 4 hours	90.752		102.3	-5.9		103.2		106.2
Weekdays, Offpeak (Midday & Evening)			105.5	21.1		104.5	-5.2	108.8
Subtotal, Average Weekday			207.8	15.2		207.6		215.0
Saturday	90.752		87.8	5.1		89.0	1.2	94.8
Sunday	90.752		50.5	1.8		50.0	-0.5	51.9
Subtotal, Non-Peak Direction			50.5	29.1			-8.2	30.5
Annual Total Patrimance after 30% Increase			61.846	-7.9		60.423	1,161.1	62.616
NET RAIL REVENUE TOTAL			\$77,308	179.7		\$83,111	1,646.8	\$86,191
Annual Total PASSENGER MILES			801,166	-128.7		774,616	15,046.5	802,737

Table 1-7

LOW PATRONAGE FORECAST FOR 1986 FIVE YEAR PLAN UPDATE
(All Trips in Thousands)

	FARE INCREASE RETENTION FACTOR	FY 87/88			FY 88/89			FY 89/90			FY 90/91		
		DAILY INCREMENT	WEEKLY INCREMENTS	GROWTH FACTOR	DAILY INCREMENT	WEEKLY INCREMENTS	GROWTH FACTOR	DAILY INCREMENT	WEEKLY INCREMENTS	GROWTH FACTOR	DAILY INCREMENT	WEEKLY INCREMENTS	GROWTH FACTOR
PATRONAGE AFTER 30¢ FARE INCREASE IN 1986													
PEAK LOAD POINT													
Weekdays, At Current Capacity	96.142	53.8	0.0		53.8	0.0							
Weekdays, Response to New Service	96.142	5.5	18.4		12.1	33.3							
Subtotal, Peak Direction		59.3	18.4		66.0	33.3							
NON-PEAK DIRECTION													
Weekdays, Remaining Peak Period Trips	96.142	46.8	1.0	0.42	47.0	1.0							
Subtotal, Peak 4 hours		106.2			113.0								
Weekdays, Offpeak (Midday & Evening)	90.752	108.8	21.8	4.12	113.3	22.2							
Subtotal, Average Weekday		215.0			226.3								
Saturday	90.752	94.8	5.8	6.52	101.0	6.2							
Sunday	90.752	51.9	1.9	3.82	53.9	2.0							
Subtotal, Non-Peak Direction		30.5			31.4								
Annual Total Patronage after 30¢ Increase		62,616	1,205.0	5.32	65,976	1,268.8							
NET RAIL REVENUE TOTAL		\$86,191	1,711.1		\$93,685	1,801.6							
Annual Total PASSENGER MILES		802,737	15,616.9		855,043	16,443.1							
PATRONAGE AFTER 15¢ FARE INCREASE IN 1989													
PEAK LOAD POINT													
Weekdays, At Current Capacity	97.932	53.3	-2.8		52.7	-2.8		52.7	-2.8		52.7	0.0	
Weekdays, Response to New Service	97.932	11.4	29.7		16.3	24.5		16.3	24.5		21.3	24.9	
Subtotal, Peak Direction		64.7	26.9		69.1	21.7		69.1	21.7		74.0	24.9	
NON-PEAK DIRECTION													
Weekdays, Remaining Peak Period Trips	97.932	46.5	-1.5	-0.62	46.2	-1.5		46.2	-1.5		46.4	0.9	
Subtotal, Peak 4 Hours		111.2			115.3			115.3			120.4		
Weekdays, Offpeak (Midday & Evening)	94.982	110.4	8.0	1.42	111.9	7.7		111.9	7.7		116.5	22.8	
Subtotal, Average Weekday		221.6			227.2			227.2			237.0		
Saturday	94.982	98.5	3.6	3.72	102.1	3.7		102.1	3.7		108.8	6.6	
Sunday	94.982	52.5	0.6	1.42	53.3	0.7		53.3	0.7		55.3	2.1	
Subtotal, Non-Peak Direction		10.8			10.6			10.6			10.6		
Annual Total Patronage after 15¢ Increase		63,797		2.62	66,248			66,248			69,191.4		
NET RAIL REVENUE TOTAL		\$ 95,372			\$104,882			\$104,882			\$109,552		
Annual Total PASSENGER MILES		817,878			849,299			849,299			887,029		

Table 1-8
"LIGHT" PATRONAGE FORECAST FOR 1966 FIVE YEAR PLAN UPDATE
(All Trips in Thousands)

FARE INCREASE RETENTION FACTOR	FY 84/85		FY 85/86		FY 86/87		FY 87/88	
	ACTUAL	WEEKLY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	GROWTH FACTOR	DAILY INCREMENT
PATRONAGE AT 1985 FARES								
PEAK LOAD POINT								
Weekdays, at Current Capacity	57.4	287.0	-2.42	56.0	-7.0			
Weekdays, Response to New Service	0.0	0.0		0.0	0.0			
Subtotal, Peak Direction	57.4	287.0		56.0	-7.0			
NON-PEAK DIRECTION								
Weekdays, Remaining Peak Period Trips	48.1	240.5	0.42	48.3	1.0			
Subtotal, Peak 4 Hours	105.5	527.5		104.3	-6.0			
Weekdays, Offpeak (Midday & Evening)	106.2	530.9	4.22	110.6	22.1			
Subtotal, Average Weekday	211.7	1,058.4		214.9	16.1			
Saturday	86.5	86.5	6.52	92.1	5.6			
Sunday	51.0	51.0	4.02	53.0	2.0			
Subtotal, Non-Peak Direction	908.8			908.8	30.8			
Annual Total Patronage at Current Fares	60,798		2.92	62,560	33.9			
NET RAIL REVENUE TOTAL	\$66,441			\$68,190	\$34			
Annual Total PASSENGER MILES	789,292			810,772	413			

PATRONAGE AFTER 30% FARE INCREASE IN 1986											
PEAK LOAD POINT											
Weekdays, At Current Capacity	96.142			54.9	-6.9		53.8	-5.4		53.8	0.0
Weekdays, Response to New Service	96.142			0.0	0.0		2.7	13.5		5.5	14.0
Subtotal, Peak Direction				54.9	-6.9		56.5	8.1		59.3	14.0
NON-PEAK DIRECTION											
Weekdays, Remaining Peak Period Trips	96.142			47.4	1.0	-1.62	46.6	-3.7	0.42	46.8	1.0
Subtotal, Peak 4 Hours				102.3	-5.9		103.2			106.2	
Weekdays, Offpeak (Midday & Evening)	90.752			105.5	21.1	1.12	106.7	6.0	6.32	113.4	33.6
Subtotal, Average Weekday				207.8	15.2		209.9			219.6	
Saturday	90.752			87.8	5.1	1.32	89.0	1.2	6.52	94.8	5.8
Sunday	90.752			50.5	1.8	2.22	51.7	1.1	7.42	55.5	3.8
Subtotal, Non-Peak Direction				50.5	29.1		51.7	4.6		44.2	
Annual Total Patronage after 30% Increase				60,386	-7.9	1.12	61,038	12.5	4.92	64,025	57.4
NET RAIL REVENUE TOTAL				\$75,764	\$180		\$86,674	\$209		\$90,915	\$82
Annual Total PASSENGER MILES				782,600	-129		791,056	163		829,763	744

Table 1-8
"MOTOR" PATRONAGE FORECAST FOR 1986 FIVE YEAR PLAN UPDATE
(All Trips in Thousands)

FARE INCREASE RETENTION FACTOR	FY 87/88		FY 88/89		FY 89/90		FY 90/91	
	DAILY INCREMENT	WEEKLY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	WEEKLY INCREMENT	GROWTH FACTOR	DAILY INCREMENT	WEEKLY INCREMENT
PASSENGER AFTER 30% FARE INCREASE IN 1986								
PEAK LOAD POINT								
Weekdays, At Current Capacity	53.8	0.0		53.8	0.0			
Weekdays, Response to New Service	5.5	14.0		12.1	33.3			
Subtotal, Peak Direction	59.3	14.0		66.0	33.3			
NON-PEAK DIRECTION								
Weekdays, Remaining Peak Period Trips	46.8	1.0	0.4%	47.0	1.0			
Subtotal, Peak 4 Hours	106.2			113.0				
Weekdays, Offpeak (Midday & Evening)	113.4	33.6	6.3%	120.6	35.7			
Subtotal, Average Weekday	219.6			233.6				
Saturday	90.752			94.8	5.8	6.5%		
Sunday	55.5	3.8	7.4%	59.6	4.1			
Subtotal, Non-Peak Direction		44.2			47.0			
Annual Total Patronage after 30% Increase	64,025	57.4	6.4%	68,140	79.1			
NET RAIL REVENUE TOTAL	\$90,915	\$82		\$96,759	\$112			
Annual Total PASSENGER MILES	629,763	744		683,097	1,026			
PASSENGER AFTER 15% FARE INCREASE IN 1989								
PEAK LOAD POINT								
Weekdays, At Current Capacity	53.3	-2.8		52.7	-2.8		52.7	0.0
Weekdays, Response to New Service	11.4	29.1		18.3	24.5		21.3	24.9
Subtotal, Peak Direction	64.7	26.9		69.1	21.7		74.0	24.9
NON-PEAK DIRECTION								
Weekdays, Remaining Peak Period Trips	46.5	-1.5	-0.6%	46.2	-1.5	0.4%	46.4	0.9
Subtotal, Peak 4 Hours	111.2			115.3			120.4	
Weekdays, Offpeak (Midday & Evening)	117.5	20.5	3.6%	121.7	20.9	6.3%	129.4	38.3
Subtotal, Average Weekday	228.8			237.0			249.8	
Saturday	98.5	3.6	3.7%	102.1	3.7	6.5%	108.6	6.6
Sunday	58.1	2.6	4.6%	60.8	2.7	7.4%	65.3	4.5
Subtotal, Non-Peak Direction		25.3			25.8			50.4
Annual Total Patronage after 15% Increase	66,700	51.4	3.7%	69,137	46.9	5.6%	72,999.8	74.3
NET RAIL REVENUE TOTAL	\$101,584	\$205		\$112,901	\$218		\$119,209	\$121
Annual Total PASSENGER MILES	864,435	667		896,016	607		946,078	963

estimates. The current and previously projected ridership estimates are summarized below (in millions).

<u>Fiscal Year</u>	<u>85 Plan</u>	<u>86 "Low"</u>	<u>86 "High"</u>
85/86	61.8	61.8	60.4
86/87	63.0	60.4	61.0
87/88	67.4	62.6	64.0
88/89	70.5	61.8	66.7
89/90	73.4	66.2	69.1

The new projections translate directly into reduced net rail revenue estimates as indicated below (in \$ millions).

<u>Fiscal Year</u>	<u>85 Plan</u>	<u>86 "Low"</u>	<u>86 "High"</u>
85/86	\$77.3	\$77.3	\$75.8
86/87	\$89.5	\$83.1	\$86.7
87/88	\$95.7	\$86.2	\$90.9
88/89	\$107.9	\$95.4	\$101.6
89/90	\$119.7	\$104.9	\$112.9

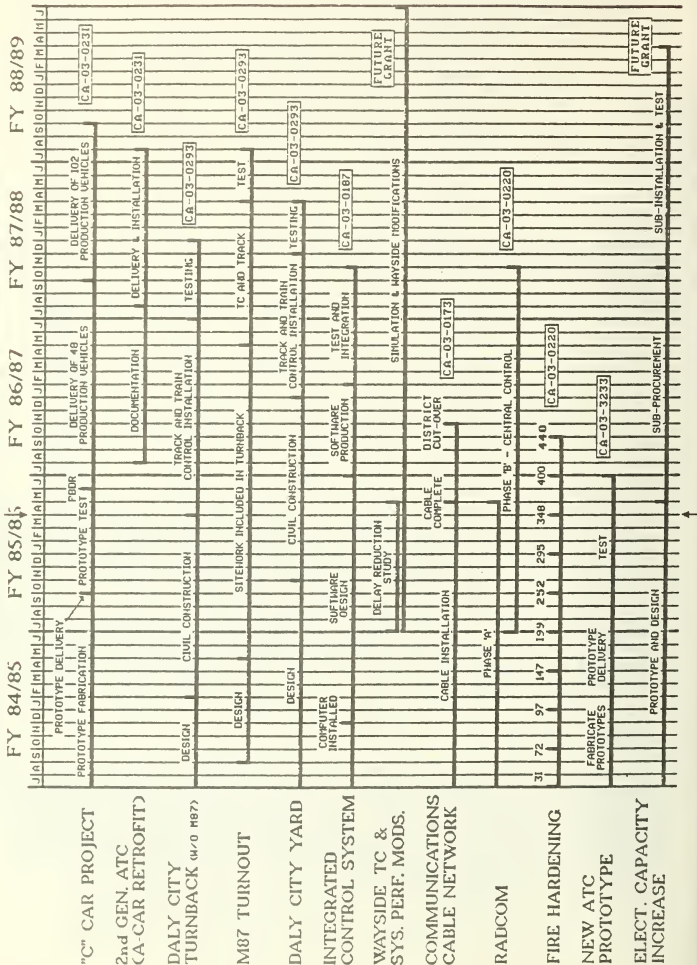
The new estimates range from \$2.8-6.4 million less than the 1985 plan in FY 86/87 up to \$6.8-14.8 million less in FY 89/90. If not offset by comparable revenue increases from other sources, or correspondingly lower cost estimates, these reductions in fare revenue will force a careful reexamination of the District's five-year operating budget financial plan.

The 1986 patronage forecast update is somewhat more conservative than previous estimates. Note, however, in Table I-4 that peak load point ridership is projected to increase by one-third over the next five years. Without the Capacity Expansion Program, this extra ridership could not be accommodated by the existing system.

ADEQUATE CAPACITY

Increasing BART's capacity is the goal of the District's Capacity Expansion Program which is now well underway. Updates to project schedules have been made since last year's Five Year Plan. The current status of major project schedules is summarized in Figure I-2. Note that the completion dates or schedule indicated here and elsewhere in this document for these projects refer to the most recent planning estimates for project completion and may differ from contract schedule dates.

MAJOR PROJECT SCHEDULES



The BART Capacity Expansion Program developed in its current form in the 1983 Five Year Plan is shown in Table I-10. The program is designed to reduce minimum headways, thereby permitting more trains to be placed in service. Projects required to achieve or support each successive headway reduction are identified together with their respective completion dates.

After each necessary set of projects is complete, service expansion can take place. The proposed target dates for service expansion are shown in Table I-10. The target dates reflect current plans for capital project implementation. Completion dates may be altered by funding limitations or changes necessary for smooth project implementation. The key consideration in adding new service is to maintain or enhance current reliability standards, even if that requires additional time for solving problems and testing in order to assure a smooth transition to higher service levels. BART's guiding philosophy is to insist on high-quality service.

Each higher service level is characterized by the number of peak-hour, peak-direction Transbay trains, the total number of peak-period trains and cars on-line, the spare car requirements, and the total cars required. Projected availability figures are shown for comparison purposes. The C-Car project will add 150 vehicles to the District fleet. The impact of the C-Car delivery schedule on total fleet size during the planning period is indicated in Table I-10.

Current BART service is nearly at capacity in terms of effective use of available B-Cars. Although additional A-Cars are available, any new trains would require taking B-Cars from already scheduled consists. For this reason, no more peak service trains will be added until after the vehicle fire hardening program is completed in October 1986, as is shown in Table I-10. Completion of this program and commencement of delivery of the new C-Cars will augment the fleet somewhat by late 1987. But significant expansion of capacity will not be possible until September 1988 when all of the new C-Cars are delivered and available for service and four key capacity expansion projects are completed: the Daly City Turnback, the new Integrated Control System (ICS), removal of the vent separation requirement based on CPUC authorization, and the third rail and yard components of the electrification upgrade.

SERVICE EXPANSION CONSIDERATIONS

For several years it has been recognized that BART capacity expansion is essential. Peak load point ridership is approaching the average peak hour crowding limits that patrons are apparently willing to tolerate. Latent demand survey research indicates that current potential ridership is several times the number of commuters actually using the system. Growth of new CBD-oriented peak period travel is likely, given current and projected office expansion plans in San Francisco and Oakland. Significant expansion of alternate highway transportation capacity, especially during the next few years in the Transbay corridor, is not planned.

Table I-10

BART CAPACITY EXPANSION PROGRAM *

4/1/86

MINIMUM HEADWAY CAPABILITY (MIN:SEC)	PROJECTS REQUIRED TO ACHIEVE OR SUPPORT THIS HEADWAY	ANTICIPATED PROJECT COMPLETION DATES	TARGET EXPANDED START DATES	PEAK HOUR TRAINS PEAK DIRECTION TRANSBAY	PEAK PERIOD CAPACITY ON-LINE CARS	SPARE CARS	TOTAL CARS REQUIRED	AVAILABLE FLEET A/C-CARS 85% B-CARS 80% (EXTRA)	OPERATING FLEET SIZE
3:45	CURRENT SERVICE	---	JUL 80	16	43 A B T	86 235 321	16 24 40	108 (+6) 260 (+6) 369 (+8)	128 240 418
3:30	KE TRACK	MAR 86	1)						
	FIRE HARDENING (CARS COMPLETED)	OCT 86	JAN 87	17	45 A B T	90 246 336	16 24 40	114 (+8) 270 (+8) 384 (+8)	135 300 435
	DELIVERY OF 48 C-CARS	SEP 87	2)	17	48 A B T	96 246 386	16 0 40	114 (+2) 41 270 425	135 48 300 485
3:10	FIRE HARDENING (REMOVAL OF VENT SEPARATION)	OCT 87	3)						
	ICS	OCT 87							
	DAILY CITY TURNBACK	DEC 87							
	ELECT. CAPACITY INCREASE: INSTALL FEEDER & YARD	APR 88							
	DELIVERY OF 102 ADDITIONAL C-CARS (150-TOTAL)	SEP 88	JAN 89	19	54H A B T	108 92H 246H 446	6 27 24 57	114 119 270 512 (+9)	135 150 300 585
2:30	DAILY CITY YARD	MAR 88	4)						
	NEW ON-BOARD ATC (A-CAR RETROFIT)	JUL 88							
	N-87 INTERLOCKING	JUL 88							
	ELECT. CAPACITY INCREASE: PROCURE & INSTALL SUB- STATION	MAR 89	SEP 89	24	57 A B T	114 90 246 450	0 38 24 62	114 128 270 512	135 150 300 585
	WAYSIDE TRAIN CONTROL/SYSTEM PERFORMANCE MODS	JUL 89							
2:15	BRAKE RATE ALGO- RITHM MODIFICA- TIONS	TBD	5) TBD	26					

* Footnotes to table appear on following page.

FOOTNOTES TO CAPACITY EXPANSION PROGRAM TABLES

- d Status as of December 1985.
- e With completion of firehardening, add 15 cars on-line (4 A's, 11 B's); 2 new consists (1-10 & 1-5).
- f Assumes 3 B's and 1 A on average will not be in operating fleet while awaiting repair of accident damage.
- g With first set of C-Cars, add 47 cars on-line (41 C's, 6 A's); 26 cars on 3 new consists (2-10's & 1-6) plus 21 cars to other trains.
- h Includes 2 extra 10-car trains required for operation of Daly City Turnback (prior to system resignaling) which do not increase actual capacity during regular peak cycle.
- i 3:10 headway permits addition of 6 consists (5-10's & 1-5) and 8 cars to other consists; 63 cars on new and existing consists (including 2-10's required for Daly City Turnback) plus 17 cars to spares.
- j 2:30 headway permits increase of on-line capacity of 5 consists; 25 additional cars on-line (note: requires further increase in spares of 5 vehicles and assumes requirement for 2 trains in Daly City Turnback is offset through resignaling).

The BART Capacity Expansion Program is designed to meet this need to transport more commuters, especially in the Transbay corridor. As the projects which comprise this program are completed, BART will be able to increase Transbay service capacity in several phases. This phased expansion of capacity is summarized in Table I-10.

To which routes should the extra trains be added? This section outlines and updates the planned allocation of new service increments by route. The Transbay component of existing 43-train service is summarized graphically in Figure I-3. This graph indicates the number and sequencing of trains by route for the P.M. peak train cycle. Figure I-3 represents the baseline against which to compare subsequent service levels.

The future peak load point demand projections by route in the above section were based generally on the planned car and train allocation documented in the 1985 Five Year Plan. The few changes in the planned allocation which now seem warranted were based on updated growth projections by route. In the updated demand analysis, new service car allocation was guided by the same criterion utilized with existing capacity; load factors were balanced across the four routes (except where train length constraints exist). The revised assumptions about incremental capacity increases which are implicit in Table I-4 are discussed in this section.

The relationship between peak load point load factors and growth rates by route provides one indicator of where to add capacity. Other factors to consider on a route-by-route basis are the magnitude of current peak ridership, the level of peak load factors (especially on the most crowded trains), the availability of alternative transit services and the level of congestion on parallel freeways.

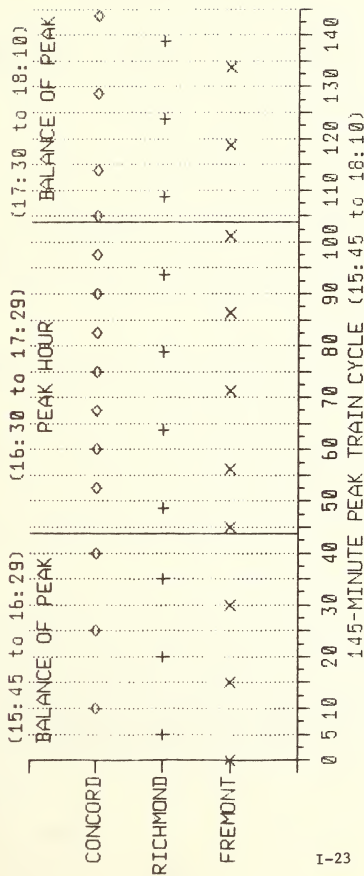
Other factors to consider in deciding where and when to add new peak period capacity include the total magnitude of peak direction ridership and the degree of maximum crowding (the highest train load factors) by route. During 1985, total peak load point ridership by route was as shown in Table I-11. Ridership on the Concord route exceeds Fremont/Daly City patronage by 45%, Richmond/Daly City trips by 108%, and Richmond/Fremont volume by 274%.

Table I-11
PEAK PERIOD, PEAK DIRECTION
RIDERSHIP BY ROUTE, 1985

<u>Route</u>	<u>Peak Hour</u>	<u>Balance of Peak Cycle</u>	<u>Total</u>
Concord/Daly City	6,649	5,673	12,322
Fremont/Daly City	4,851	3,650	8,501
Richmond/Daly City	2,903	3,016	5,919
Richmond/Fremont	1,670	1,627	3,297
Total	16,073	13,966	30,039

FIGURE I-3

CURRENT 43-TRAIN SERVICE LEVEL
PM PEAK PERIOD TRANSBAY SEQUENCE
PK HR: 7 CONCORD, 5 FREMONT, 4 RICHMOND



NOTES:

- (1) Sequence starting at 3:45 PM from Embarcadero Station.
- (2) Total of 43 trains on line -- C/DC=14, F/DC=10, R/DC=9, F/RI=10.
- (3) Throughput on R/DC equal to 10 trains due to shorter route miles.
- (4) Minimum headway is 3 minutes 45 seconds.

Maximum train load factors differ significantly by route, as shown in Table I-12. This tabulation indicates the average load factor for the most crowded train on each route during the P.M. peak period in 1985. The load factors reflect actual ridership versus scheduled capacity.

Table I-12
AVERAGE LOAD FACTOR FOR
MOST CROWDED TRAIN ON EACH ROUTE, P.M. PEAK, 1985

Route	Train #	Load Factor
Fremont/Daly City	109	1.78
Concord/Daly City	391	1.45*
Richmond/Daly City	Varies	1.38
Richmond/Fremont	Varies	1.37

*Maximum 10-car consist load factor.

The most crowded train load factor is an index of patron trip scheduling preference or constraint. Over the last several years, the peak has broadened on the Concord route as more riders adjusted their travel schedules in order to take advantage of lower load factors in the balance of the peak cycle. A significant proportion of Fremont/Daly City riders is unwilling or unable to do so. Thus, this route experiences the highest level of crowding on the most heavily loaded train.

Capacity of the bus transit system and the highway network in each corridor should also be considered in allocating future BART peak capacity increases. The Concord route effectively has no parallel bus service, and virtually all highway traffic is constrained to the congested Caldecott Tunnel. The Richmond corridor is facing increased traffic congestion on Interstate 80, and this has reduced the travel time advantage of AC Transit service compared to BART. The corridor stretching south from Oakland to Fremont is served by State Highway 17 and Interstate 580, each of which is less congested than Interstate 80. AC Transit service, especially in the Interstate 580 corridor, is attractive and competitive with BART. Delays affecting traffic approaching the San Francisco-Oakland Bay Bridge are also increasing. This condition is beginning to affect the toll free carpool-bus lane through the Toll Plaza.

PLANNED SERVICE INCREMENTS

All of the above factors have been considered in developing the proposed allocation of future BART service increments among the four routes currently operated. Planned additional trains are indicated by route in Table I-13 together with existing service. The proposed plan calls for a phased increase of 14 trains from the 43 now operated to 57 by FY 89/90. Current plans call for four increments. Planned service increments reflect estimated requirements based on current demand projections. Should these requirements change prior to start-up dates, service increments will be modified accordingly.

Table I-13

DESCRIPTION OF PROPOSED PEAK PERIOD SERVICE

Service Increment	Headways and Trains On-Line						
	FY 85/86	FY 86/87 Jan-Jun	FY 87/88 Oct-Jun	FY 88/89 Jul-Dec	FY 88/89 Jan-Jun	FY 89/90 Beginning Sep 89	FY 90/91 Sep 89
Headways (Min:Sec)		First	Second		Third	Fourth: Alternate A	Fourth: Alternate B
Minimum Sustainable	3:15	3:05b	3:05	3:05	2:40d	1:40f	1:40f
Minimum Scheduled	3:45	3:45	3:45	3:45	3:10d	2:30f	2:30f
Basic Route: Peak ^a /Midday	15:00	15:00	15:00	15:00	12:40/15:00	10:00/15:00	10:00/15:00
<u>Trains On-Line, By Route</u>							
Concord/Daly City							
Peak 60 Minutes	7	7	7	7	+1	8	+4g
Balance of Peak	7	+1	8	9	+1	10	12
Fremont/Daly City							
Peak 60 Minutes	5	+1	6 ^b	6	+1	7	+19
Balance of Peak	5	5	+1	6	+1	7	8
Richmond/Daly City							
Peak 60 Minutes	4	4	4	4	+2	6	4
Balance of Peak	5	5	5	5	5	5	5
Transbay							
Peak 60 Minutes	16	+1	17	17	+2	19	+5
Balance of Peak	17	+1	18	20	+2	22	24
Richmond/Fremont							
Peak 60 Minutes	5	5	+1	6	6	6	+59
Balance of Peak	5	5	5	5	5	5	22
Total							
Peak 60 Minutes	21	+1	22	+1	+2	25	+5
Balance of Peak	22	+1	23	+2	+2	30	+59
Total	43	+2	45	+3	+4	57	+59

a. Not including extra peak Concord trains.

b. Reflects completion of and capabilities provided by Sectional Release at M87, availability of additional cars following completion of Fire Hardening, and completion of KE track. Extra peak hour train will be inserted into existing schedule with most trains unaffected.

c. Anticipates delivery of 48 C-cars.

d. Anticipates completion of and capability provided by Fire Hardening (removal of vent separation), Daly City Turnback, ICS Phase II, delivery of 102 additional C-cars (150 total received), and third rail and yard components of the Electrification upgrade.

e. Does not include 2 10-car trains required for operation of Daly City Turnback (prior to system resignaling).

f. Depends on capability provided by Daly City Yard, M-87 Interlocking, New On-Board ATC (A-car retrofit) and modifications recommended by the System Performance Study.

g. Increase over third increment reflected in Alternate B.

First Increment

In the first increment two trains would be added following the completion of the vehicle firehardening program. At that time, 15 additional cars should be available. These cars would be put into service as 5-car and 10-car consists. The 10-car train would be added to the Fremont/Daly City route in the peak hour. The 5-car train would augment Concord/Daly City service in the balance of the peak cycle. These two routes would be expanded in the first service increment because they currently experience the highest average peak load factors and carry the highest volume of riders. This increment should reduce somewhat the crowding on the most heavily loaded train, on the Fremont route.

According to current plans, these service adjustments would be accomplished without significant changes in the current published weekday service timetable. The extra Fremont train would be inserted into the peak hour schedule with minor adjustments to the schedules of the leading and following trains. This addition would take advantage of the system's ability to absorb some schedule compression for a short interval without significant impact on over-all train service. On the Concord route, four extra trains now run in 7 1/2-minute headways between the basic 15-minute intervals. The proposed extra Concord train would be scheduled in another 7 1/2-minute slot in the balance of the peak cycle.

Second Increment

The second increment is planned to begin after delivery of the first 48 C-Cars. At the 85% availability objective, this will add 41 C's to service. It is also planned that 6 of the remaining 8 unutilized A-cars would be added. This 47-car increment will provide two new 10-car trains and one 6-car train and 21 cars with which to lengthen existing consists as necessary.

Since no further peak hour Transbay headway reduction is planned as a part of the second increment, the two new 10-car trains will be added to the balance of the peak cycle in much the same way as the first increment Concord train was added. That is, shorter-headway peak hour operation would be extended into the shoulder of the peak. This will entail only minor revision of the published timetable.

According to current plans as shown in Table I-13, a train would be added to two of the three Transbay routes. Each of these trains would be a 10-car consist. In addition, a 6-car consist would be added to peak-hour service on the Richmond/Fremont route. This train would augment capacity in the peak of the peak thereby reducing crowding which now occurs on the smaller, lower-level platform at 12th Street/Oakland City Center Station. This train would be injected into the existing schedule without impacting other trains.

The remaining 21 cars would be used to lengthen consists not at the 10-car limit, as growth requires. The anticipated allocation shown in Table I-13 calls for 8 cars added to Richmond/Daly City peak hour trains, 10 cars to trains on this route in the balance of the peak cycle, and 3 more cars to the Concord/Daly City route.

Table I-14

SERVICE REQUIREMENTS AND PROJECTED CAR ALLOCATION BY ROUTE
BASED ON ANTICIPATED PM PEAK DEMAND, CAR AVAILABILITY, AND PROPOSED SERVICE EXPANSION

Service Increment	FY 85/86 ^a		FY 86/87 Jan-Jun ^b		FY 87/88 Oct-Jun ^c		FY 88/89 Jul-Dec		FY 89/90 ^f Sep-Jun		FY 90/91	
	First	Second	Third		Fourth		Fifth		Sixth		Seventh	
Concord/Daly City	70	70	70	70	70	70	70	70	70	70	70	70
Peak 60 Minutes	64	+5	69	+13	82	82	+13	95	+6	86	86	86
Balance of Peak									+3	98	98	98
Fremont/Daly City	50	+10	60	60	60	60	+10	70	+7	77	77	77
Peak 60 Minutes	38	38	+10	48	48	48	+5	53	+3	56	56	56
Balance of Peak												
Richmond/Daly City	32	32	+8	40	40	40	40	40	+2	42	42	42
Peak 60 Minutes	27	27	+10	37	37	37	+5	42	+3	45	45	45
Balance of Peak												
Richmond/Fremont	25	25	+6	31	31	31	31	31	31	31	31	31
Peak 60 Minutes	15	15	15	15	15	15	15	15	15	15	15	15
Balance of Peak												
Total On-Line	86	44	90	+6	96	96	+8	104	+10	114	114	114
A/C-Cars	235	+11	246	+41	287	287	+35	322	+14	336	336	336
B/C-Cars	321	+15	336	+47	383	383	+43	426	+24	450	450	450
Total	16	16	16	16	16	16	-2	14	+5	14	14	14
Spares	24	24	24	24	24	24	+19	43		48	48	48
A/C-Cars	102	44	106	+6	112	112	+10	122 ^e	+6	128	128	128
B/C-Cars	259	+11	270	+41	311	311	+70	381 ^e	+3	394	394	394
Total	361	+15	376	+47	423	423	+80	503 ^e	+9	512	512	512
Available Fleet	108	114	155	155	155	155	282	282	282	282	282	282
A/C-Cars	261	270	270	270	270	270	270	270	270	270	270	270
B/C-Cars	369	384	423	423	423	423	423	423	423	423	423	423
Total	6	8	2	2	2	2	9	9	0	0	0	0
Surplus (shortage)	2	0	0	0	0	0	0	0	0	0	0	0
A/C-Cars	8	8	8	8	8	8	8	8	8	8	8	8
B/C-Cars	2	2	2	2	2	2	2	2	2	2	2	2
Total	8	8	8	8	8	8	8	8	8	8	8	8

a. Reflects 43-train service.

b. Reflects 45-train service.

c. Reflects 48-train service.

d. Reflects 52-train service.

e. Includes 20 cars required for operations with Daly City Turnback.

f. Reflects 57-train service.

Third Increment

The third service increment is targeted to follow completion of the five projects shown in Table I-10 as necessary to achieve a minimum scheduled headway of 3 minutes 10 seconds. These 5 projects include PUC approval of fire hardening and removal of the vent separation requirement, delivery of the remaining 102 C-cars, completion of ICS, the third rail and yard components of the electrification upgrade, and the Daly City Turnback.

Current plans call for the addition of six trains and 80 cars in the third increment. Operation of the Daly City Turnback will require two 10-car consists in addition to the normal on-line requirements. These two trains reflect the additional time needed for the Transbay routes to transit the Turnback and, therefore, do not represent an increase in effective capacity. Concurrent with this service increment, the spares requirement will be increased by 17 in recognition of the larger number of trains in service. The net result of the Turnback and increased spares requirements is that on-line capacity will grow by 43 cars and 4 trains, bringing the total trains on-line to 52.

The reduction in the minimum headway to 3 minutes 10 seconds will permit the addition of two trains in peak hour Transbay service. Based on the service expansion factors reviewed above, current plans call for one more peak hour train on each of the Concord and Fremont/Daly City routes. Each would be a 10-car consist. The remaining 23 cars would comprise two additional trains in the balance of the peak cycle, one each on the same two routes, plus additional cars on the Richmond/Daly City route. The general reduction in headways associated with this increment will require revision of the published weekday timetable. The Transbay train service at the 52-train level is illustrated in Figure I-4.

Fourth Increment

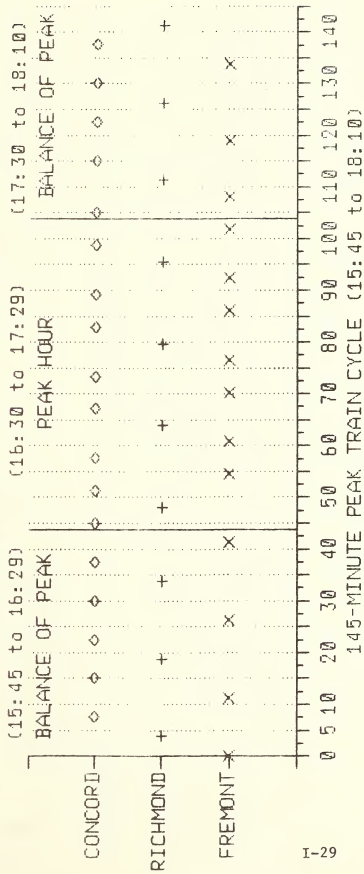
The final increment during the current five-year planning cycle is tentatively anticipated to begin in September 1989. The minimum headway reduction to 2 minutes 30 seconds depends on the capability provided jointly by four projects: retrofit of new on-board ATC into existing A-cars, and completion of the Daly City Yard, the M-87 interlocking, and certain modifications called for by the System Performance Study.

Attainment of the 2 minute-30 second headway capability will allow the scheduling of five more Transbay trains in the peak hour, bringing the total trains on-line to 57. Several options exist for allocating the additional five trains among the three routes. Because of uncertainty about future demand and service requirements, two service options are illustrated in Figures I-5 and I-6.

Alternative A shown in Figure I-5 features 9 trains each in the peak hour Transbay from Concord and Fremont, and 6 from Richmond. This represents an increase over the third increment of 2 trains each on the Fremont and Richmond routes and one on the Concord route. Peak hour transbay headways would alternate between 5 and 7 1/2 minutes on the Concord and Fremont routes, with

FIGURE I-4

52-TRAIN SERVICE LEVEL PM PEAK PERIOD TRANSBAY SEQUENCE PK HR: 8 CONCORD, 7 FREMONT, 4 RICHMOND

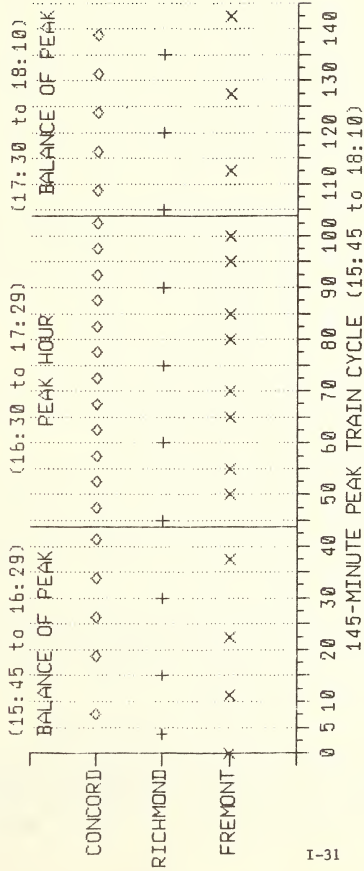


NOTES:

- (1) Sequence starting at 3:45 PM from Embarcadero Station.
- (2) Total of 52-trains on line -- C/DC=18, F/DC=14, R/DC=9, F/RI=11.
- (3) Throughput on R/DC equal to 10 trains due to shorter route miles.
- (4) Minimum headway is 3 minutes 10 seconds.

FIGURE I-6

ALTERNATIVE 57-TRAIN SERVICE LEVEL PM PEAK PERIOD TRANSBAY TRAIN SEQUENCE PK HR: 12 CONCORD, 8 FREMONT, 4 RICHMOND



NOTES:

- (1) Sequence starting at 3:45 PM from Embarcadero Station.
- (2) Total of 57 trains on line -- C/DC=19, F/DC=16, R/DC=11, F/RI=11.
- (3) Throughput on R/DC equal to 12 trains due to shorter route miles.
- (4) Minimum headway is 2 minutes 30 seconds.

12 1/2-minute Richmond headways. On the A-line, Richmond-Fremont trains would follow Transbay Fremont trains by 2 1/2 minutes.

Alternative B (Figure I-6) consists of 12 Concord trains, 8 Fremont trains and 4 Richmond trains in the peak hour Transbay. Under this alternative, four of the additional 5 trains would be operated on the Concord route and one on the Fremont route. Headways would be 5 minutes on the Concord route, alternating between 5 and 10 minutes for Fremont and 15 for Richmond.

At this point, neither alternative is clearly preferable to the other from the standpoint of potential demand. The load factor/growth rate model discussed above is probably most accurate in the short run. Some degree of uncertainty exists with regard to projections of demand for one route versus another four to five years from now. For this reason, projections should be updated periodically prior to the targeted start date. A decision regarding the allocation of fourth increment train service should be postponed until the demand picture is clearer and other service considerations have been evaluated.

It is also anticipated that resignaling efforts systemwide will reduce run times enough to offset the two trains required in the third increment for the Daly City Turnback. In effect, Transbay throughput during the peak period will increase by two trains on account of resignaling. Expansion of the number of trains in service will increase the spares requirement by 5 cars. The fourth increment will add 24 cars on-line. Another timetable revision would be forthcoming at this point.

Future Vehicle Requirements

According to current plans, all available vehicles including the C-cars will be in service as of the fourth increment. This is indicated in Tables I-10 and I-14. Expansion of service capacity beyond this level will require the acquisition of additional rolling stock.

The currently planned number of vehicles could be utilized more intensively during the peak hour in the fifth increment when headways can be reduced to 2 minutes 15 seconds. That is, more trains could be scheduled in the peak hour and made up with cars redistributed from the balance of the peak cycle. However, this is probably only a short-term solution of only marginal benefit. If peak demand growth meets or exceeds the forecast rate, more vehicles will be required.

This condition is not expected to occur within the current Five Year Plan timeframe, and is thus not pursued in greater depth at this point. However, the issue of buying additional vehicles should be reconsidered with sufficient lead time to bring on extra capacity when needed. The key factors influencing this decision will be the availability of capital funds and the indication of continued strong peak period demand.

Service Increment Summary

The results of the peak period demand projections and the planned service build up in terms of additional cars and trains are summarized in Table I-15. Also shown are projected load factors based on anticipated throughput.

Table I-15

1986 FIVE-YEAR UPDATE: P.M. PEAK PERIOD, PEAK DIRECTION
ACTUAL AND PROJECTED TRAIN SERVICE LEVELS,
LOAD FACTORS AND PATRONAGE AT MAXIMUM LOAD POINTS

	--- CURRENT SERVICE ---		--- 1st INCREMENT ---		--- 2nd INCREMENT ---		--- 3rd INCREMENT ---		--- 4TH INCREMENT ---		FY 90/91
	FY 84/85	FY 85/86	Add	FY 86/87	Add	FY 87/88	Add	FY 88/89	Add	FY 89/90	
Peak 60 Minutes											
Concord/Daly City	7 / 70	7 / 70	7 / 70	7 / 70	7 / 70	7 / 70	1 / 10	8 / 80	1 / 6	9 / 86	
Load Factor#	1.45	1.39	1.41	1.42	1.34	1.37		1.29		1.37	9 / 86
Patronage	6,718	6,459		6,584	7,178			7,459		7,931	7 / 931
Freemont/City	5 / 50	5 / 5	1 / 10	6 / 60	1 / 10	7 / 70	2 / 7	9 / 77		9 / 77	
Load Factor#	1.50	1.50		1.45	1.37			1.34		1.28	
Patronage	4,715	4,713		5,467	6,290			6,486		6,808	
Richmond/Daly City	4 / 32	4 / 32	8 / 8	4 / 40	4 / 40	4 / 40	2 / 2	6 / 42		6 / 42	
Load Factor#	1.35	1.37		1.44	1.18			1.25		1.32	
Patronage	2,910	2,944		3,091	3,208			3,405		3,647	
Subtotal/Transbay	16 / 152	16 / 152	1 / 10	17 / 162	17 / 170	2 / 20	19 / 190	24 / 205	5 / 15	24 / 205	
Load Factor#	1.46	1.48		1.40	1.38		1.38	1.31		1.37	
Patronage	14,341	14,116		15,109	16,873		17,592	18,631		19,335	
Freemont/Concord	5 / 25	5 / 25	1 / 6	6 / 31	6 / 31	6 / 31	6 / 31	6 / 31		6 / 31	
Load Factor#	1.18	1.13		1.14	0.88		0.90	0.95		0.98	
Patronage	1,661	1,597		1,607	1,665		1,665	1,741		1,810	
Totals/Concord	21 / 177	21 / 177	1 / 10	22 / 187	23 / 201	2 / 20	25 / 221	30 / 236	5 / 15	30 / 236	
Load Factor#	1.43	1.44		1.43	1.33		1.32	1.26		1.32	
Patronage	16,002	15,713		16,716	17,000		18,556	19,335		20,441	
Balance of Peak Cycle											
Concord/Daly City	7 / 64	7 / 64	1 / 5	8 / 69	1 / 13	9 / 82	1 / 13	10 / 95	1 / 3	10 / 98	
Load Factor#	1.30	1.22		1.28	1.10		1.12	1.26		1.36	
Patronage	5,709	5,774		6,063	6,477		7,309	8,559		9,865	
Freemont/City	5 / 38	5 / 38	1 / 10	6 / 48	1 / 5	7 / 53	1 / 5	7 / 56	1 / 3	7 / 56	
Load Factor#	1.29	1.36		1.36	1.12		1.12	1.14		1.22	
Patronage	3,676	3,699		3,867	3,999		4,224	4,562		4,902	
Richmond/Daly City	5 / 27	5 / 27	1 / 10	5 / 37	1 / 5	5 / 42	1 / 5	5 / 45	1 / 3	5 / 45	
Load Factor#	1.22	1.26		1.35	1.10		1.10	1.14		1.25	
Patronage	3,033	3,126		3,352	3,530		3,751	4,153		4,541	
Subtotal/Transbay	17 / 129	17 / 129	1 / 5	18 / 134	2 / 23	20 / 167	2 / 23	22 / 190	1 / 9	22 / 199	
Load Factor#	1.28	1.35		1.35	1.13		1.13	1.16		1.26	
Patronage	12,420	12,611		13,262	14,006		15,324	17,074		18,433	
Freemont/Richmond	5 / 15	5 / 15	1 / 5	6 / 20	1 / 5	7 / 25	1 / 5	7 / 25	1 / 5	7 / 25	
Load Factor#	1.08	1.04		1.00	0.80		0.80	0.80		0.80	
Patronage	1,618	1,505		1,600	1,629		1,649	1,666		1,666	
Total, Balance of Peak	22 / 144	22 / 144	1 / 5	23 / 149	2 / 33	25 / 182	2 / 23	27 / 205	1 / 9	27 / 214	
Load Factor#	1.35	1.35		1.35	1.22		1.22	1.22		1.22	
Patronage	14,038	14,176		14,882	15,635		16,943	18,719		20,097	
Totals/Concord	43 / 321	43 / 321	2 / 15	45 / 336	3 / 47	48 / 383	4 / 43	52 / 426	5 / 24	57 / 450	
Load Factor#	1.34	1.38		1.37	1.22		1.22	1.22		1.32	
Patronage	30,040	29,669		31,598	32,635		35,479	38,052		40,338	

* Scheduled Capacity

Based on Projected Throughput

If demand by route grows in accordance with the projections and new capacity is allocated as proposed, the planned service should be reasonably well balanced by FY 90/91 in terms of average load factors. During the peak hour, load factors on the three Transbay routes are projected to be virtually identical.

As noted above, all vehicles are assumed to be in service by FY 90/91. If patronage response to the initial service increments is as projected, and overall demand is growing, plans to acquire additional vehicles will need to be re-examined. This consideration should be monitored annually.

SERVICE QUALITY

Although provision of adequate capacity has become the District's top priority, this emphasis in BART policy does not mean that reliability can be taken for granted. Indeed, improved service quality was largely responsible for attracting and maintaining the addition to BART patronage experienced during recent years (see Table I-16 on page I-35). Continued growth of BART ridership will depend heavily on the extent to which service quality can be maintained and improved. The issue of service quality addresses system performance and its impact on patronage. Research in this area of transit performance indicates that ridership tends to be more responsive towards changes in service quality than in fares. BART patronage growth since October 1980 supports this finding. A decline in service measures during the July-September 1985 quarter because of construction activities at Daly City and on the KE track was accompanied by below forecast patronage.

Because scheduling more trains on the system will alter the current operating environment, it will be essential to maintain system reliability while implementing capacity improvements. Work completed as a part of the System Performance Study has contributed to the identification of achievable capacity objectives in the context of current high reliability standards.

Many improvements in system performance were produced by the Reliability Improvement Program. Results of this effort are best exemplified by increased on-time performance, improved car and train throughput, and reduced incident rates for passenger offloads, AFC equipment, and train removals.

Earlier improvements in operating dependability supported BART's decision in 1978 to publish a train schedule for both evening and weekend service. Daytime weekday train performance improvements as reflected by a 95% on-time record justified publication of a similar schedule for weekday operations in April 1983. This timetable constitutes a more stringent basis for assessing service quality which is available to all patrons and other interested persons. Maintenance of high quality service will be increasingly challenging, especially as BART commences its service expansion program.

COST EFFECTIVENESS AND PRODUCTIVITY

Cost effectiveness and productivity are integral to overall financial performance and the economies of providing expanded levels of service.

Table I-16

OPERATING PERFORMANCE AND RELIABILITY COMPARISON

REVENUE SERVICE PARAMETERS	JULY 1976	JUL-SEP 80 ¹	JUL-SEP 82 ¹	JUL-SEP 84 ¹	JUL-SEP 85 ¹
Total Ridership	2,771,533	3,827,172	4,587,320	5,065,032	5,217,334
Number of trains scheduled during peak service hours	33	44	42	43	43
Car Availability at 8 AM (Percent)	61%	83%	88%	90%	87%
Percent of scheduled runs completed	90%	96%	99%	99%	99%
Percent of train runs "On Time"	46%	85%	94%	95%	92%
Revenue car hours	57,707	83,699	90,554	93,367	95,565
Total revenue & nonrevenue vehicle equipment failures (per 1,000 car-hours)	20.2	11.1	11.5	11.1	
Vehicle equipment caused unscheduled train removals (per 1,000 car-hours)	5.4	2.6	1.4	1.5	
Total offloads (per 1,000 car-hours)	2.4	1.6	1.2	1.6	2.1
Automatic fare collection incidents (per 1,000 passenger trips)	0.65 ²	0.52	0.34	0.30	0.33
Percent of scheduled peak period, peak direction, Transbay throughput:					
Train:	N/A	N/A	98%	98%	97%
Cars:	N/A	N/A	97%	97%	96%
Farebox ratio	39% ³	45%	47%	48%	44%
Operating ratio	42% ³	51%	51%	54%	50%
Annual miles per car: BART average	N/A	75,000	75,000	73,000	74,000
Industry average	N/A	50,000	50,000	50,000	N/A
Vehicle related maintenance headcount	425	360	360	360	360

1. Monthly average for 3-month period

2. Data for 1977.

3. Ratios are for FY 1975/76.

Favorable performance in these, as well as for other areas, is directly dependent upon management's ability to formulate and implement effective programs which can keep pace with inflation. Recent trends for District financial performance indicate that this has in fact occurred, where stringent budget controls and above forecast revenues, in large part due to better service, have produced better than anticipated results. In real terms, BART costs per passenger, and per vehicle mile have declined over the past six and one-half years, as shown by the constant dollar comparisons in Figures I-7 and I-8. At the same time, BART patronage and vehicle miles per equivalent employee have risen. This is solid evidence of BART productivity. Additional gains in the future will be harder to attain, thus management efforts should be focused on strategies to hold the line on expense, and to evaluate new ways of allocating resources.

Future operating budget considerations will be examined. However, several factors first need to be recognized in the general context of financial effectiveness.

Staffing costs comprise the largest component of total operating expense. While this may decline somewhat if electrical energy assumes a larger proportion, staffing cost is the one factor most directly under District control. Staffing levels materially affect labor cost, and to the extent that output can be increased without proportional increases in staffing, future labor cost increases can be held within the limits of available resources.

Secondly, since available information suggests that electrical energy cost increases will rise faster than all other cost components, District efforts will need to focus on developing operating strategies which can lead towards reduced levels of power consumption (i.e., reduced car miles), consistent with stated load factor objectives, and on potential alternative sources of electrical energy.

Finally, the planned streamlining of the BART Express Bus service should be continued as planned. This component of expense has increased in recent years, and its farebox ratio is well below the standard set for overall District operations.

On the funding side, increasing transit operator demands for regionally allocated discretionary funds are expected to limit BART's share of these resources. Additionally, capital funding limitations will require BART to continue to generate a portion of its capital funding requirements through operating sources in order to provide for essential system replacements and improvements. These limitations are expected to become more severe as competition for decreasing federal capital funds becomes more intense.

Continued pressure on the District's financial resources will further emphasize the need for efficient and effective operating strategies which incorporate innovative productivity measures into the overall approach. Further, key capital improvements which can enhance current operational efficiencies will need to be completed in order to realize long-term economies and increased productivity. Both the Daly City Turnback and Yard and the new C-cars will produce significant operational benefits and resulting cost

FIGURE I-7

PATRONAGE AND COST COMPARISON

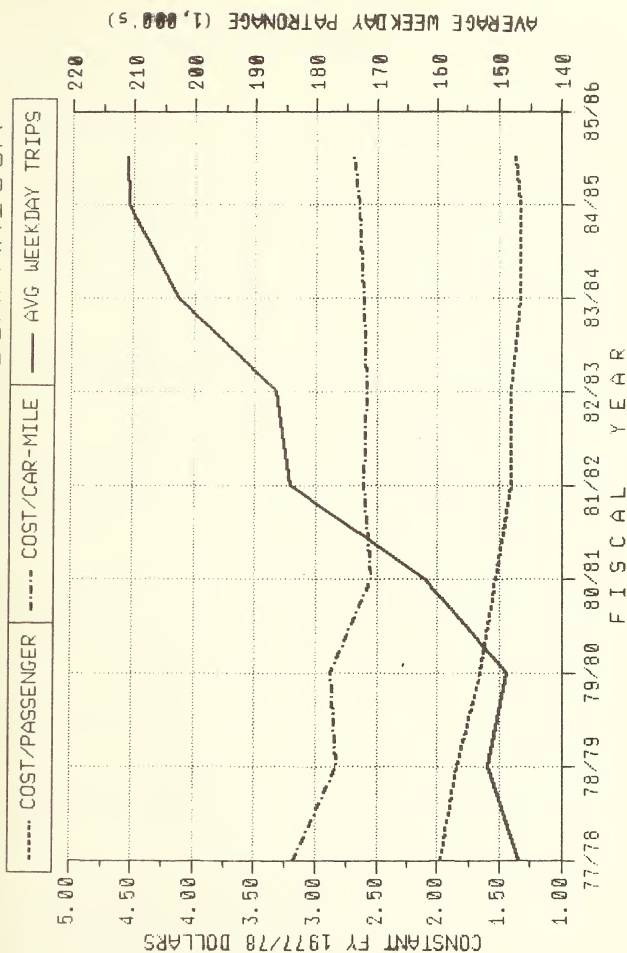
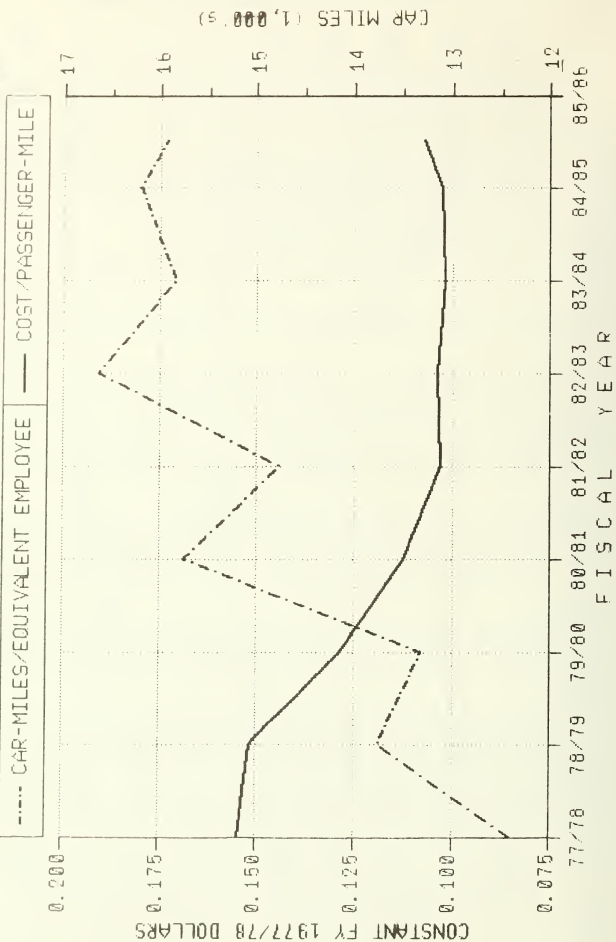


FIGURE I-8

SERVICE OUTPUT & COST COMPARISON



savings. In the future, BART must exploit every possible operating efficiency in order to reduce cost pressures and minimize the size of necessary fare increases.

PROGRAM DELIVERY

Realizing BART's inherent economies of scale and latent capacity potential by the end of this planning period is a realistic but challenging objective. Based on the projections noted above, it seems reasonable to expect significant growth in ridership if capacity increases can be delivered in a timely manner. These capacity increases depend heavily on implementation of the District's Capital Improvement Program. The principal elements of the capital program have been well established for several years and include:

KE Track

The third downtown Oakland track (KE track) is required to increase capacity through the heavily travelled Oakland wye, where all four routes merge. This project was completed in December 1985 and operations utilizing this track commenced in March 1986.

Vehicle Fire Hardening

The currently imposed CPUC subway vent separation requirement effectively limits scheduled San Francisco line headways to 3 minutes 30 seconds, or 17 trains per hour. The removal of this restriction is contingent upon the completion of the vehicle fire-hardening program.

New Revenue Vehicles

One hundred fifty new revenue vehicles are needed to service anticipated patronage growth. The new C-car will permit expansion of existing consists which are less than 10 cars long, addition of new trains, as well as efficient on-line sizing of trains.

Central Train Control Computer

A new central train control computer will be required for operations exceeding the existing computer capacity limit of 49 on-line trains.

Electrification Upgrade

Operation of increased numbers of peak period trains at reduced headways will require additional power distribution facilities on the C-Line and in all three yards.

Daly City Turnback

Higher density train operations will require a more efficient and less time consuming train reversing facility at Daly City, where the minimum scheduled turnback time is now 3 minutes 30 seconds (versus a required minimum of 2 minutes 15 seconds).

New Vehicle Automatic Train Control System (ATC)

The existing ATC units on all A-cars represent the largest single cause of vehicle service disrupting failures on the system. The New Vehicle ATC system will substantially reduce ATC caused service disrupting failures. This system will be installed in all C-cars and will also be retrofitted into all existing A-cars.

Daly City Yard & Shop

A westbay storage facility will be needed to lay up vehicles not needed for midday operations. Layups at this yard will produce significant savings in power and vehicle maintenance costs. Shop facilities are also under construction which could provide essential support to the new yard and in maintaining lower headways.

M-87 Interlocking

Relocation of the turnout to track 3 at Daly City Station is needed to eliminate interference between a train berthing on that track and one being dispatched from track 1.

Wayside Train Control/System Performance Modifications

The System Performance Study determined that a number of improvements will be necessary, in addition to those listed immediately above, to achieve BART's five-year capacity objectives while maintaining or enhancing service quality. This program will include the following key tasks:

- o Reconfiguration of track circuits by moving and adding blocks,
- o Resignaling of some parts of the system
- o Modification of station approach markers
- o Modification of SORS software to reduce time to initialize (reset) this system
- o Enhancement of central computer control capabilities
- o Development of a delay reduction program
- o Enhancement of train operations simulation capability

Further, in order to attain the 2 1/4-minute headway objective, it will be necessary to analyze and develop brake rate algorithm modifications and seek for approval by the CPUC.

Attainment of the increased capacity potential inherent in the BART system with the completion of these projects depends upon their joint implementation. Lacking one or more of these major components, the system will not be capable of performing at the required higher level of capacity.

Estimated completion dates for these projects are highlighted in Figure I-2 above. The service expansion scenario described above depends completely on realization of these capacity enhancements as scheduled. Timely funding and effective project management are therefore essential to assure the delivery of these important capital improvements as scheduled.

EXTENSIONS

Extensions to the 71-mile basic system were thoroughly reviewed in the "New Starts and Extensions" hearings held by the Metropolitan Transportation Commission (MTC) in FY 1983/84 for the purpose of prioritizing these and other regional projects for future implementation. The resulting MTC New Starts and Extensions Program supports the four BART extensions which are in Phase I (Within Current Three-County District Priority) of the BART Extension Policy.

Acquisition of purchasable extension station sites is in progress. Interim usage of these acquired future rail station sites is being coordinated with the District's planned improvements to the Express Bus program to provide freeway-oriented, park/ride lots for Express Bus service.

MAINTENANCE REQUIREMENTS

In late 1976, BART implemented a new Maintenance and Engineering philosophy from which a new Maintenance Plan evolved. Basically, for the three maintenance divisions within the department, Engineering sets the criteria, Maintenance performs the work using Engineering provided documents, and Inspection, at predetermined times, ensures that Maintenance is performing to Engineering criteria. There is no appeal beyond Engineering. This tried and proven philosophy will remain in effect now and in the future.

A description of District maintenance departments, personnel, facilities, and a summary of BART's maintenance program are included in Appendix A (under separate cover).

EXPRESS BUS EFFECTIVENESS AND PRODUCTIVITY

Concern about the cost, relatively low farebox recovery ratio, and local service nature of BART Express Bus Service led to a major reevaluation of this program. Efforts to upgrade the program began with the drafting of a revised scope of services which formed the basis for an amended contract signed during FY 1984/85. On-time performance standards and a farebox revenue objective were established. The reevaluation of service has sought to identify opportunities for reduction of scheduled travel times by shifting to more freeway-oriented operations.

ENERGY CONTINGENCY REQUIREMENTS

Although gasoline supplies are currently more than adequate given the worldwide oil glut, energy contingency concerns should not be ignored. In the event of a significant gasoline shortage which would potentially divert large

numbers of automobile commuters to the system, BART will not be able to expand peak period service until the new revenue vehicles now on order are delivered. All available BART rail vehicles are currently in service. A few additional vehicles will become available when the fire hardening program is completed by October 1986, but significant capacity expansion will not occur until January 1989 with the reduction in Transbay headways to 3 minutes 10 seconds.

In view of this inability to expand capacity significantly until early 1989, BART's response to a gasoline shortage will of necessity be comprised of the following types of activities:

- o Extension of peak period service beyond the current transition to offpeak service to accommodate commuters who can shift their normal working hours;
- o Provision of information about train loading patterns especially with reference to space available in non-peak directions for reverse commuting;
- o Potential consideration of higher peak period fares to shift non-essential trips to offpeak periods.

Each of these responses to a gasoline shortage condition could be implemented within a fairly short time interval.

CAPITAL INVESTMENT PLANNING

For the past several years, BART has recognized the need to implement capacity expansion projects which will augment the inherent capability of the present system to transport commuters into the congested Central Business Districts of San Francisco and Oakland. This need to develop and finance a number of major capacity expansion projects has entailed a comprehensive capital investment planning effort. This work involves a determination of needs and/or problems to be resolved, identification of alternatives and evaluation of potential solutions. After selection of appropriate projects, funding strategies are developed to maximize state and local financial resources. Capital investment planning, following these guidelines, is an integral part of BART's Five Year Planning process.

PRIVATIZATION

Although BART is a public agency, a considerable amount of its operating budget is spent on contracted provision of goods and services, mainly through private firms. There is growing recognition that private providers may have an important role in support of transit operations, especially as public financial support is diminished. Pressure on future operating budgets will require that alternative sources of goods and services be considered. BART has already identified possible opportunities for private providers of selected feeder and/or Express Bus service and has established a notification process to ensure that such opportunities are communicated to private providers.

In addition, BART seeks to participate actively with the private sector in a joint development program as a means of financing access improvements.

In response to more definitive federal guidelines on privatization, BART has prepared detailed documentation of its efforts to date in this regard. This information has been transmitted to the Urban Mass Transportation Administration (UMTA) in support of current grant applications, and is contained in Appendix D (under separate cover).

DISADVANTAGED AND WOMEN BUSINESS ENTERPRISE

All sectors of the economy merit an equal opportunity to participate in publicly financed endeavors. BART has specifically recognized this concern in setting its annually adopted performance objectives. BART's performance through FY 1984/85 has approximated or exceeded the District's goals, and District management recognizes the need to maintain a strong resolve to provide an affirmative action contract environment.

FIVE YEAR PLANNING

BART was in the vanguard of transit systems which developed management-by-objectives processes, systematic performance monitoring, and five-year planning efforts. This corporate philosophy continues to guide District management and policy makers. The District Quarterly Performance Report on System Objectives is keyed to the Program Area outline which structures BART's Five Year Plan. In other words, the objectives which are developed in the planning process form a detailed checklist by which management performance is routinely monitored and publicly communicated to all interested persons. BART considers this process essential to sound management and effective delivery of responsive transit service.

The BART Five Year Plan includes an analysis of key factors which affect the management and operation of the system. Service planning is a major focus of this plan, as is the development of 5-year financial forecasts. Periodic fare structure adjustments are necessary to keep pace with inflation and provide new services as appropriate. In this regard, the planning process is essential to determine the magnitude of equitable fare increases necessary for the attainment of incremental revenue targets.

BART's Five Year Plan also addresses improved efficiency of operation through the Productivity Improvement Program, and monitors Elderly and Handicapped services through the BART Access Program.



CHAPTER II

OPERATIONS AND CAPITAL
IMPROVEMENT PROGRAM

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The preceeding chapter outlined general considerations for this year's Five Year Plan update. Future demand expectations were reassessed, highlighting the need for adequate capacity without compromising service quality. Important issues including cost effectiveness, productivity, and program delivery were also identified. The purpose of this chapter is to review recent District performance and to examine the outlook for the future.

The following discussion is presented by program area: the nine areas of District activity which respond to the Board adopted goals (see page i-3). Following general introductory remarks which highlight past performance, the discussion is divided into four major sections within each program area. These are:

FY 1985/86 OBJECTIVE STATUS

A review of District performance for the first half of FY 1985/86 with respect to each of the Board adopted program area objectives.

FUTURE OUTLOOK

Based on an analysis of recent data and trends, an assessment of likely year-end performance is presented relative to each objective. Additional discussion focuses on likely performance beyond June 1986 and within the current 5-year planning horizon.

PLANNED IMPROVEMENTS

This section presents BART's strategy for assuring continued favorable performance. Specific projects and programs are highlighted in terms of future considerations.

PROGRAM AREA OBJECTIVES

The fourth and final section identifies revised program area objectives for the upcoming 1986/87 fiscal year and also for the four remaining years in the current planning timeframe. For detailed information on each project, see Appendix C.

Additionally, Figure II-12 which follows the program area discussion (beginning on page II-62, identifies all priority capital projects and summarizes each project's implementation schedule.

PROGRAM AREA A: BASIC SYSTEM SERVICE AND CAPACITY

Provision of adequate capacity continues to be the main thrust of District planning efforts, given over a decade of strong growth of demand and projected increases. The last major capacity addition was introduced with the phasing of close headways service during the summer of 1980, from 3- to 4-route Transbay service (with the addition of the Richmond/Daly City route). This improvement increased peak period on-line trains from 33 to 42, and on-line cars from 272 to 310. While scheduled peak hour Transbay capacity is 55% greater today, the growth in demand since 1980 kept peak hour train load factors virtually unchanged (1.40 then versus 1.34 presently). And with all available B-cars currently being used, higher load factors and constrained ridership levels are clearly part of BART's future until additional capacity can be provided.

FY 1985/86 OBJECTIVE STATUS

The phased implementation of the KE Track and Daly City Turnback required close coordination of construction work for these two projects with scheduled revenue service. Starting July 8, 1985, train control work performed on the KE track between MacArthur and 19th Street stations required all trains on this segment to be manually operated at reduced speeds. Except for night and Sunday service, all scheduled Richmond and Concord train departures were moved up two minutes for the duration of this work in order to maintain scheduled arrival times at downtown Oakland and San Francisco stations. KE track work completed in late December 1985 allowed for the reinstatement of automatic train operations between MacArthur and 19th Street stations in March 1986.

Beginning August 8, 1985, construction of the Daly City Turnback required that one of the three station platforms at Daly City be removed from service on an alternating basis. This project phase is currently scheduled to be completed during the third quarter this fiscal year. As an interim measure, overhead signal lights have been installed to direct passengers to in-service platforms. In order to maintain scheduled service, train reversing at the two in-service platforms requires all Daly City dispatches to be advanced 30 seconds (only for four-route service on weekdays).

Objective status with respect to key train performance measures for Basic System Service and Capacity and Reliability reflect the impact of this construction on revenue service.

As summarized in Table II-1 on page II-3, weekday service now calls for 43 on-line trains during peak periods, 39 for midday operations, and 14 for 2-route night service. Similarly, scheduled weekend service remains unchanged this year with 31 on-line trains required for Saturday daytime service and 14 on-line trains for Saturday night and all day Sunday service.

As of December 1985, BART's operating fleet consisted of 128 A's and 290 B's. Four a.m. pre-peak car availability averaged 104 A-cars and 258 B-cars for the July-December 6-month period (versus 102 and 261 A- and B-car availability objectives for the same period). This actual availability compares to service requirements (for afternoon peak period operations during December) of 102 A-cars and 259 B-cars and represents 81% and 89% of the operating A- and B-car fleet, respectively.

Actual peak period Transbay capacity averaged 97.0% of scheduled trains and 95.1% of scheduled cars. This is below BART's throughput objectives of 98.0% for trains and 97.5% for cars.

Based on representative data, systemwide load factors for the first half of FY 1985/86 averaged 1.40 for peak hour operations, 1.23 for the balance of the peak period, and 0.75 for offpeak service (versus an objective which calls for all maximum offpeak train load factors to average no greater than 1.05). These load factor averages, however, do not reveal the rather wide range of values recorded for individual routes. Peak hour load factors ranged from a high of 1.51 on the Fremont/Daly City route to a low of 1.20 on the Richmond/Fremont route, and individual train load factors were even higher. The current District objective for peak period operations calls for balancing load factors for discretionary trains (consists which can be lengthened or shortened within the 3- to 10-car limitation). For discretionary trains, peak period load factors for the July-December period averaged 1.23 for Concord/Daly City, 1.22 for Richmond/Daly City, 1.21 for Fremont/Daly City, and 1.17 for Fremont/Richmond. The discretionary train load factor objective was attained since any shifting of cars off the Fremont/Richmond

Table II-1

SCHEDULED SYSTEM CAPACITY (As of December 1985)

NUMBER OF TRAINS	C O M M U T E				W E E K D A Y		SATURDAY ^a		SUNDAY/HOLIDAY	
	AM PEAK	MIDDAY	PM PEAK	NIGHT ^a			DAY	NIGHT	DAY	NIGHT
Concord/Daly City	14	10	14	7			8	7	7	7
Fremont/Daly City	10	10	10	b			8	b	b	b
Richmond/Daly City	9	9	9	b			7	b	b	b
Fremont/Richmond	10	10	10	7			8	7	7	7
Total On-Line	43	39	43	14			31	14	14	14
Spares	8	7	8	c			c	c	c	c
Total Required	51	46	51	21			c	c	c	c
NUMBER OF A-CARS										
Concord/Daly City	28	20	28	14			16	14	14	14
Fremont/Daly City	20	20	20	b			16	b	b	b
Richmond/Daly City	18	18	18	b			14	b	b	b
Fremont/Richmond	20	20	20	14			16	14	14	14
Total On-Line	86	78	86	28			62	28	28	28
Spares	16	14	16	14			c	c	c	c
Total Required	102	92	102	42			c	c	c	c
NUMBER OF B-CARS										
Concord/Daly City	106	32	106	40			20	16	40	11
Fremont/Daly City	69	22	65	b			19	b	b	b
Richmond/Daly City	42	15	44	b			14	b	b	b
Fremont/Richmond	18	10	20	8			8	7	11	7
Total On-Line	235	79	235	48			61	23	51	18
Spares	24	8	24	12			c	c	c	c
Total Required	259	87	259	60			c	c	c	c

a. Base service requirement without consideration of major special events which may require additional capacity.

b. No service on these routes during these times.

c. Spare requirements are a yard option for weekend service. A minimum of one train per yard is kept as a ready spare.

route would have resulted in excessively high load factors on the resulting shorter trains. The offpeak objective was virtually achieved: offpeak load factors on only one of 39 offpeak trains exceeded the 1.05 target during the July-September 1985 quarter.

FUTURE OUTLOOK

Despite the construction impact of the KE Track and Daly City Turnback, it appears that all of the objectives for this program area will be achieved this fiscal year. This is predicated on recovery of performance during the second half of the year with the completion of the KE Track and the current construction phase of the Daly City Turnback in March 1986 (and subsequent return to 3-platform service from Daly City Station).

Increased ridership over the last decade has placed a premium on peak hour capacity to the point that load factors for the balance of the peak period have gradually increased. This has resulted as new riders able to modify their work schedule, take advantage of less crowded train conditions just before and after the peak hour. The future outlook for reduced crowding (and the ability to accommodate higher patronage at desired load factors) will require additional peak period capacity which can only be provided by additional cars and an increase in the number of on-line trains. The system is effectively functioning at maximum service levels presently, with no major capacity additions possible until the following limitations are resolved:

Removal of Subway Vent Separation Requirement

As a result of the January 1979 Transbay tube fire and subsequent investigation, BART is restricted to operating no more than one train between any two subway air vents. This is a precautionary measure imposed to minimize the risk of smoke from a train being drawn past other trains. The removal of this restriction is dependent upon completion of the vehicle fire-hardening program and approval from the California Public Utilities Commission (PUC).

Additional Cars

Even if BART could operate at closer headways, the current car inventory of 136 A's and 303 B's would not permit scheduling additional capacity. The vehicle fire-hardening program (see Program Area C: Safety and Security, on page II-17 requires the removal of 5 A's and 11 B's until this project is completed in October 1986. This means the District will have a maximum of 109 A-cars and 261 B-cars to form online and ready spare trains (under current headway capabilities, however, only 102 A's can be used). Additional cars will be required, both to lengthen currently scheduled trains where possible and also to make up additional trains once headways can be reduced.

Central Train Control Computer

BART's existing train control computer is limited to supervising a maximum of 49 on-line trains and is approaching the end of its useful life. With future operations requiring up to 75 on-line trains at 2 minute 15 second headway operation and more for system extensions, a new system capable of handling substantially more traffic will be required.

Insufficient Power Distribution Facilities

Planned future service levels will exceed the capacity of current power distribution facilities on the C-Line and in the three yards. Upgrades of these facilities are essential.

Terminal/Turnback Zone Configuration and Approach Speeds

With the exception of the Richmond terminal zone, those located at Concord, Fremont, and Daly City require trains to cross in front of one another in negotiating inbound and outbound movements. This, together with excessively slow speeds (as low as 3 miles per hour), increases the time required for reversing trains at the ends of each line. This is most critical at Daly City since this is the turnback point for the three Transbay routes and therefore reflects the highest service frequency on the system. Until recently, turnback parameters have limited operations to a 3 minute 45 second headway which resulted in the current schedule of 16 trains per hour reversed at Daly City. A 3 minute 30 second headway is now possible based on train control modifications to the existing track in the vicinity of Daly City completed last year which permit scheduling one additional train in the peak hour. Full utilization of this capability must await delivery of additional revenue vehicles. To reduce headways further will require a more efficient track configuration and signal protection to allow for improved train reversing.

A-Car Automatic Train Control System (ATC)

The ATC units on BART A-cars operate at an unacceptable reliability rate. The current ATC system comprises the principal cause of service disrupting failures of the BART vehicle. A headway of 2 minutes 30 seconds will not be possible using current ATC units. Second generation ATC units developed for the C-car will have an improvement of 25 to 1 and will replace current A-car ATC units.

Primary Train Detection

Uncertainty prior to the beginning of BART service about the primary train detection system's ability to recognize continuously all online trains led to the CPUC requirement for backup detection systems. The Computer Assisted Block System (CABS) was used initially. This was replaced by the backup system currently in effect, Sequential Occupancy Release System (SORS), which provides adequate detection but compromises the ability to operate trains on headways less than 3 minutes 30 seconds. Completion of the System Performance Study reveals that reconfiguration of the track detection circuits, resignalling, and modification of SORS software along with other enhancements will be needed to allow headways of 2 minutes 30 seconds.

Brake Rate Algorithm Modifications

Another finding of the System Performance Study is that, to achieve the ultimate goal of 2 minute 15 second headways, some relaxation of braking parameters in signalling will be required, either by raising the signalling brake rate or reduction of other brake delay assumptions. This will involve safety studies and a request to the CPUC.

PLANNED IMPROVEMENTS

A description of proposed peak period service for the next five years is presented on page I-25, with peak period service defined by the number of trains on line by route

and resulting headways in minutes. Current peak period service is shown as 43 on-line trains. With one exception, this essentially represents the maximum level of peak period capacity which can be provided between now and the end of 1987 when the phased delivery of the new C-cars begins to have a significant impact on the size of BART's vehicle fleet. Obviously, this will have a bearing on system load factors given the foregoing demand projections.

The exception noted above refers to the addition of 2 new peak period trains beginning in January 1987. These trains will consist of cars which become available upon completion of the fire-hardening project in October 1986. As a result of Fremont/Daly City having the highest average load factor during the peak hours, one train during this time period is to be added on this route. The second new train will be added to Concord/Daly City service just outside the peak hour, by extending the 7 minute 30 second-route headway further into the balance of the peak period.

The next significant addition of on-line capacity is scheduled to occur during the latter half of 1987, when expansion of peak period service to 48 trains will be possible with the receipt of 48 C-cars by September 1987.

The reduction of the minimum scheduled headway to 3 minutes 10 seconds and the start of 54-train service will be possible by September 1988 after: the completion of the turnback portion of the Daly City project by December 1987, the completion of vehicle fire hardening (providing the basis for CPUC removal of the vent separation requirement which is scheduled to take place by October 1987), central train control computer enhancement by October 1987, minor modifications covered under the electrification upgrade project, and the delivery of the balance of the new revenue vehicles by September 1988.

Completion of the Daly City Yard by March 1988, new on-board ATC units on all A-cars by July 1988, the M-87 Interlocking by July 1988, and other improvements identified by the System Performance Study by July 1989, are expected to result in a further reduction of the minimum scheduled headway to 2 minutes 30 seconds and resulting expansion of on-line trains to 57. The changes recommended by the System Performance Study (beyond those improvements already described) relate to changes affecting wayside train control, and include: reconfiguration of track circuits, resignalling of portions of the system, modification of station approach markers, modification of SORS software, and enhancement of central computer control capabilities. Although schedules have been developed for implementing these changes prior to the September 1989 target date assumed in Table I-10, this effort will be complex and difficult to implement in conjunction with the remaining BART capacity expansion program, and funding of the whole project is not yet assured.

The next service level anticipated after September 1989 is a decrease in the scheduled minimum headway from 2 minutes 30 seconds to 2 minutes 15 seconds. This will require a change in the braking algorithm used for signalling and, ultimately, CPUC approval.

In order to implement the proposed service expansion scenario, several major projects must be completed. District efforts will, therefore, continue to focus on the timely implementation of already programmed essential capital projects which, when completed, will permit an 85% expansion of BART capacity as outlined above. In summary, these essential projects are:

Vehicle Fire-Hardening

As a result of the January 1979 Transbay Tube Fire and subsequent investigation, BART is restricted to operating no more than one train between any two subway air vents per direction at any given time. This is a precautionary measure imposed to minimize the risk of smoke from a train being drawn past other trains. The removal of this restriction is anticipated following the completion of the District's fire-hardening program which is scheduled for completion by October 1986. Under this program, all vehicle wall and ceiling liners and floors are being reconstructed to reduce flammability and toxic smoke emissions. Until this project is completed, widely spaced vents located in the Berkeley Hills Tunnel and on the San Francisco line between Civic Center and 16th Street stations limit headways to approximately 3 minutes 30 seconds in San Francisco and 4 minutes 30 seconds on the Concord line.

New Revenue Vehicles (C-Cars)

The analysis of BART capacity requirements on page I-17 through I-24 indicates that additional vehicles are vitally necessary to meet projected ridership growth during the five-year planning period. As indicated, peak period service capacity cannot be significantly expanded until receipt of the new C-cars. To maintain maximum capacity, 85% A- and C-car and 90% B-car availability will be required along with train and car throughput of 98.0% and 97.5% respectively. Without the new C-cars, forecast patronage, if attained, will exceed system capacity, with load factors well above desired standards.

Enhanced Central Train Computer

The central train computer in conjunction with various supporting wayside equipment provides systemwide train supervision. The existing central computer is capable of monitoring the movement of up to 49 trains at any one time. Expansion of central control capabilities is needed to allow for on-line train operations exceeding this by early 1989. Current plans call for the enhancement of the existing system to be operational by late 1987. Once in place, the integrated control system (ICS) will allow BART to operate 75 on-line trains initially, with the capability of expanding the control system for operating 115 trains.

Electrical Capacity Increase

This project is designed to upgrade third rail power distribution. This will involve the installation of 2 new substations, 3 breaker stations, modification and upgrade of existing yard substations, third rail modifications and increase of yard feeder cable capacity. These improvements are planned for the C-line segment of the mainline and for all three yards, especially the Concord Yard.

Studies by DeLeuw Cather and BART staff have determined that mainline equipment will support operation up to the 50-train level, however, voltage problems will exist on the C-line at the planned five-year service level. Yard equipment will support operation up to the 50-train level, but some equipment will be overloaded at the five-year service level.

Daly City Turnback/Storage Facility

Once currently scheduled consists reach the 10-car limitation, more on-line trains will be required to increase capacity. This need already exists on the Concord and Fremont/Daly City lines during peak hours with maximum available capacity essentially

being provided and load factors continuing to increase as a result of persistent peak period patronage growth despite overcrowding. Due to current system constraints which limit minimum sustainable headways to 3 minutes 30 seconds, only one additional peak hour train can be operated until essential improvements are in place. The Daly City turnback is a critical element required for reducing headways significantly below current levels since it will provide a much more efficient terminal track configuration allowing for the achievement of service expansion as described on page I-20. An interim measure already completed permits the reduction of the minimum scheduled headway to 3 minutes 30 seconds through train control modifications in the vicinity of Daly City Station. This will facilitate the addition of one peak hour train when completion of fire hardening makes available additional vehicles.

New Vehicle Automatic Train Control System (ATC)

Current on-board ATC equipment represents the largest cause of service disruptions. The New Vehicle ATC system will substantially reduce ATC hardware failures and, through the use of built-in automatic operational redundancy, reduce ATC-caused service-disrupting failures by a factor of 25 to 1. This system will be installed in all new C-cars, and will also be retrofitted into existing A-cars.

M-87 Interlocking

As presently configured, the M-87 interlocking includes a crossover in front of the Daly City Station main platform (tracks 1 and 2), and a turnout, nearer the station, to Track 3. This configuration results in interference between a train coming in to berth on Track 3 and another being dispatched from Track 1. By moving the turnout to Track 3 beyond the crossover, such interference will be eliminated. This change will further enhance train movement flexibility in the vicinity of the Daly City Turnback.

Wayside Train Control System Installations

The System Performance Study determined that a number of improvements will be necessary, in addition to those listed above, to achieve BART's capacity objectives while maintaining or enhancing service quality. This program includes the following key tasks:

- o Reconfiguration of track circuits by moving and adding blocks
- o Resignalling of some parts of the system
- o Modification of station approach markers
- o Modification of SORS software to reduce time to initialize (reset) system
- o Enhancement of central computer control capabilities
- o Development of a delay reduction program
- o Enhancement of train operations simulation capability.

Brake Rate Algorithm Modifications

As noted above, attainment of the 2 minute 15 second headway objective will require certain brake rate algorithm modifications based on thorough analyses, and CPUC approval. Schedules for this work remain to be developed. Likewise a firm start date for this service level has not been determined.

Until capacity expansion projects are in place and service improvements started, the District will strive to improve performance within existing operational limitations.

Priority capital projects in support of basic system service and capacity are summarized in Figure II-12 beginning on page II-62.

PROGRAM AREA OBJECTIVES

Revised operating performance objectives for the current five-year period are identified in Figure II-1 on the following page.

PROGRAM AREA B: RELIABILITY

Improved service quality has largely been responsible for increased BART patronage. Continued growth of BART ridership will depend heavily on the extent to which service quality can be maintained and improved further, in light of adding more trains on the system to increase capacity.

The reliability improvement program and BART's well established preventative maintenance program have greatly assisted in improving service quality dramatically within the past decade. Whereas train on-time performance averaged well below 50% prior to FY 1978/79, today's level is above 90%, even with the delay impacts associated with construction for the Daly City Turnback and the KE Track. In the same time period, the percentage of scheduled train dispatches completed increased from 86% to 99%, while the rate for passenger offloads due to vehicle equipment was reduced by 21%.

FY 1985/86 OBJECTIVE STATUS

As noted under Basic System Service and Capacity, implementation phases of the KE Track and the Daly City Turnback, which began during the summer of 1985, had a direct impact on reliability performance. This impact is noted under appropriate indicators in the following discussion.

The percent of scheduled train dispatches completed averaged 98.5% for the July-December 1985 period. This level of performance is just under the 99% objective level.

Weekday train on-time performance averaged 91.1%, versus a 95% objective. Analysis of train performance data revealed that on-time performance would have been on the order of 94.4% had construction for the KE Track and Daly City Turnback not affected revenue service. For peak period operations, train on-time performance averaged 88.8%, compared to a 93% objective. It is estimated that KE and Daly City construction work reduced peak period on-time performance by 4 percentage points, from 92.8%.

This reduced level of schedule adherence resulted in lower than desired patron on-time performance which averaged 86.2% for the first half of FY 1985/86. Approximately 6.5 percentage points have been attributed to the impact of KE and Daly City construction. Without the impact, patron on-time performance is estimated to be on the order of 92.7%, versus a 94% objective.

The rate for primary delay events (causing peak period trains to be detained more than 7 minutes) averaged 3.10 events per 100 train runs during the first half of FY

Figure II-1

BASIC SYSTEM SERVICE AND CAPACITY PERFORMANCE OBJECTIVES

FY 1986/87

1. Balance capacity where possible such that load factors for peak period trains which can be lengthened or shortened (consists between 3 and 10 cars) are relatively equal and provide offpeak service such that no train load factor exceeds 1.05.
2. Operate weekday peak period Transbay service in the peak direction providing at least 98.0% of scheduled train throughput and 97.5% of scheduled car throughput on a monthly average basis.
3. Until December 31, 1986, make available 102 A-cars and 261 B-cars for revenue service by 4 a.m. (weekdays); thereafter, make available 106 A-cars and 270 B-cars.
4. Increase peak period capacity from 43 trains to 45 trains by adding one train each to the two most heavily travelled routes (Fremont/Daly City and Concord/Daly City) by January 1987.

FY 1987/88 to FY 1990/91

1. Operate 4-route weekday service with the capability of providing sustained 3 minute 10 second-headways by September 1988 following the completion of the Daly City Turnback reducing to 2 minutes 30 seconds by September 1989 following the completion of remaining capacity expansion projects.
2. Support the following weekday car requirements (as of the fourth quarter of each fiscal year):

<u>Service Requirements</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>
A-Cars	112	114	114	114
B-Cars	270	270	270	270
C-Cars	41	119	128	128
TOTAL	423	503	512	512

<u>Service Distribution</u>				
On-Line	383	446	450	450
Spares	40	57	62	62
TOTAL	423	503	512	512

<u>Total Fleet:</u>				
A-Cars	135	135	135	135
B-Cars	300	300	300	300
C-Cars	48	150	150	150
TOTAL	483	585	585	585

1985/86 (versus an objective rate of no more than 2 events per 100 trains). As a result of the peak period delay events, 9.47% of all peak period train runs were detained more than 7 minutes. This compares to the current objective which calls for a maximum train delay rate of 6%. The impact of each delay event thus detained an average of 3.1 trains more than 7 minutes.

The District's offload objective is measured in terms of a 12-month average rate. As of December 1985, total offload incidents amounted to 2,303. This resulted in a total offload rate of 2.03 incidents per 1,000 car hours (versus an objective rate of 1.35 incidents per 1,000 hours). The current annual rate is 28.5% higher than recorded one year earlier (as of December 1984), and is due primarily to a revision in the accounting method with respect to operations and miscellaneous caused offloads at South Hayward Station.

Of the 2,303 total offloads for the current 12-month period, 1,173 (50.9%) were the result of vehicle equipment, 122 (5.3%) were wayside equipment related, and 1,008 (43.8%) were due to operational and miscellaneous causes. The resulting 12-month incident rates per 1,000 car hours for these offload categories are: 1.03 for vehicle equipment (relative to a 1.10 objective rate), 0.11 for wayside equipment (versus a 0.05 objective rate), and 0.89 for operational and miscellaneous causes (versus a 0.20 objective rate).

Performance for automatic fare collection equipment, as measured by the maintenance technician rate, averaged 0.37 incidents per 1,000 passenger trips during the July-December 1985 period. Current performance compares to a District's AFC objective of 0.30 incidents per 1,000 trips.

Six AM availability for entry/exit gates averaged 91.7% (versus an objective of 95%). For ticket vendors, availability was 83.5% (versus a 90% objective).

The District's objective for station elevators is to maintain 6 AM availability no lower than 95%. During July-December 1985, elevator availability surpassed this objective, averaging 99.5%.

Performance for escalators also surpassed the District's 93% availability objective, with a current period average of 96.8% of all station units in service by 6 AM.

The terms of the purchase of service agreement between the District and AC Transit calls for the provision of 95% express bus on-time performance. Based on a 47% sample of all BART express bus runs during July-December 1985, 97.2% of the runs arrived at their final destination within 5 minutes of schedule.

FUTURE OUTLOOK

Based on year-to-date performance, objective achievement is anticipated with regard to scheduled weekday train dispatches completed, vehicle offload rate, elevator and escalator availability, and express bus on-time performance. Improved schedule adherence, which is expected for the latter half of FY 1985/86 in response to the completion of the KE Track and the current construction phase of the Daly City Turnback, should result in a return to typical (pre-construction) train- and patron on-time performance. Anticipated higher performance for the second half of the fiscal year, however, appears to be insufficient to raise respective indicator averages to objective levels for the year.

PLANNED IMPROVEMENTS

The major thrust in this area will be to continue to improve service quality further and at a minimum to maintain performance standards under higher density train operations. This will be done by the following:

- o Continued scrutiny of both rolling stock and wayside equipment as regards failure trends and reliability rates using the MARIS information system.
- o Further implementation of a time control system which will permit more maintenance to be scheduled and reduce unscheduled maintenance.
- o Installation of the second generation ATO on BART's current fleet of A-cars (C-cars will also contain this new equipment). The ATO system does not meet acceptable reliability and maintainability standards. The new ATO is expected to show an improvement of 25 to 1.

The District currently has 24 engineers dedicated to direct maintenance support. These consist of 12 engineers for revenue vehicle maintenance and 12 for wayside maintenance. Efforts are coordinated between these engineers and maintenance staff to solve problems, analyze failures, develop maintenance procedures, and implement modifications. The Engineering and Construction Department supports longer range maintenance activities by providing designs for projects as they are identified (i.e., C-cars, Daly City turnback/storage facility, etc.) and develops modifications of current equipment. Since 1976, BART has increased on-line trains by 30% and the number of car hours by 57%, but decreased total maintenance staff by 12%. Future increases in service, however, will require increases in maintenance personnel.

All maintenance staff participate in a comprehensive maintenance training program which includes certification following successful completion of required coursework. A technical training staff of 16 people provides this service, in addition to general training courses provided by the District to enhance management's effectiveness.

Important capital improvement efforts in this area include installing new ATO units on all A-cars. Other capital projects which address system reliability are identified in Figure II-12 beginning on page II-62.

PROGRAM AREA OBJECTIVES

Revised operating performance objectives for this program area are as identified in Figure II-2 on the following page.

PROGRAM AREA C: SAFETY AND SECURITY

Patron safety has always been of paramount concern to the District. As such, facilities and operations planning are performed in concert with BART's Safety Department to assure adherence to accepted industrywide safety standards. Numerous improvements have been made in BART's 13-year operating history in addition to the safety features included in the system's original design. These include

Figure II-2

RELIABILITY PERFORMANCE OBJECTIVES

FY 1986/87

1. Complete 99% of all monthly scheduled dispatches.
2. Conduct operations such that on a monthly basis 95% of daily terminal-to-terminal runs are completed within 5 minutes of scheduled run times with at least 93% during AM and PM peak periods for commute delays.
3. Provide service such that no more than 2% of peak period trains experience a primary delay exceeding 7 minutes and no more than 6% experience a delay from any cause exceeding 7 minutes.
4. Conduct operations such that 94% of all patron trips are completed on-time. All patron trips are on-time when trains run not more than 5 minutes late or 60 seconds early.
5. Provide service such that passenger offload rates remain at or below the following: vehicle equipment = 1.10; wayside equipment = 0.10; operations and other = 0.80; and the total = 2.00 (per 1,000 car hours).
6. Maintain the overall AFC technician maintenance incident rate at or below 0.30 incidents per 1,000 passenger trips, and maintain or exceed a 6 AM average weekday availability rate of 95% for entry/exit gates and 90% for ticket vendors.
7. Maintain a 6 AM average weekday availability of 95% for elevators and 93% for escalators.
8. Maintain express bus ontime performance such that 95% of all runs arrive at their final destination within 5 minutes of schedule.

FY 1987/88 to FY 1990/91

1. At a minimum, maintain current reliability objective level performance under higher density train operations pending additional improvements which may be identified by the System Performance Study.

modifications to vehicles, stations, right-of-way protection, and parking areas which have been implemented as a result of recommendations based on intensive and ongoing analyses of accident data. Further, the experience of the 1979 Transbay Tube fire and follow-up investigation provided BART and the entire transit industry with greater insight regarding emergency preparedness and life safety. The recommendations of this investigation were incorporated into an aggressive program to improve the safety of facilities and operations even further, which included the replacement of all vehicle seat cushions and covers with low-smoke/flame-resistant material.

Numerous other safety improvements were implemented in accordance with the investigation's recommendations. Equally as important has been the 1981 publication of an extensive and detailed emergency plan for BART which was developed in cooperation with local emergency service agencies. This has led to improved communications coordination and a better understanding of the BART system on the part of local fire departments and other emergency service providers. BART facility tours and drills are conducted on an on-going basis to assure that emergency response capabilities are maximized for critical kinds of situations at all system locations.

The District's annual patron accident rate has declined because patronage has increased more rapidly than the number of patron accidents. The number of annual passengers between FY 1978/79 and FY 1983/84, for example, grew by 41.5%, whereas the number of patron accidents increased at a much lower 9.8%. The resulting annual accident rate per million passengers thus declined 22.3%, from 22.0 to 17.1 during this five-year period.

The establishment of BART Police Services prior to the start-up of revenue operations in September 1972 was an early recognition of the District's special security requirements. Patron security has subsequently been emphasized throughout BART's planning and operational history.

Compared to many older rail transit systems, serious crimes against patrons have remained at a relatively low level. Since the latter part of 1981, BART's 12-month average patron related crime rate excluding disorderly conduct has fluctuated between 9 and 11 incidents per million passenger trips. In contrast to this is the rate for disorderly conduct which has increased substantially during the same 4-year period. As of June 1981, the 12-month rate for disorderly conduct stood at 5.3 incidents per million passenger trips. By June 1983, this rate increased to 8.4, and 13.3 incidents per million passengers in June 1985. In part, this increase reflects passage of State legislation which empowered transit district police officers to issue citations for certain offenses included under disorderly conduct. The increase in the 12-month rate for disorderly conduct pushed the rate for all patron-related crimes up 26.5% in four years, from 18.5 incidents per million passenger trips in June 1981 to 23.3 in June 1985.

This program area also focuses on the safety and security of BART employees. Discussion of this consideration is included in the following sections.

FY 1985/86 OBJECTIVE STATUS

Performance relating to patron safety is favorable as indicated by the patron accident rate which was 2.3% lower than the stated objective. As of December 1985, the 12-month average accident rate was 17.3 incidents per million trips (versus an

objective of 17.7). Actual incidents increased 11.3%, from 952 accidents during calendar year 1984 to 1,060 in 1985. For the current number of annual incidents, 805 (75.9%) occurred within stations with the remaining 255 (24.1%) accidents related to train operations. Since revenue service began in September 1972, BART has carried 532.0 million patrons 7.0 billion passenger miles without a single patron fatality.

Total incidents of patron-related crime increased 4.3%, from 1,398 during 1984 to 1,458 in 1985. Increases are recorded for rape (up from 4 last year to 5 this year), robbery (up from 97 to 134), assault/battery (up from 319 to 359), arson (up from 8 to 18), and purse snatching (up from 62 to 85). Decreases this year relative to 1984 are recorded for murder (down from 2 to 1), sex offenses other than rape (down from 90 to 82), and disorderly conduct (down from 856 to 815).

BART's patron-related crime objective for FY 1985/86 calls for a 12-month rate no higher than 18.5 total incidents per million passenger trips. For FY 1985/86, the FY 1984/85 objective was retained although actual experience exceeded this level at the time the objective was set. This objective was not revised upwards because it was felt one additional year of observation was needed to establish a realistic performance standard consistent with patron needs and the District's financial capabilities.

The District's patron-related crime rate for the 12-month period ending December 1985 is 23.7 incidents per million trips, 1.3% above the 23.4 annual rate reported for 1984. The current annual rate is based on 1,458 patron-related crimes, 815 (55.9%) of which are for disorderly conduct and 643 (44.1%) for all other categories listed above. The resulting annual rate per million passenger trips for disorderly conduct is 13.3, versus an objective of 9.5. For all other categories of patron-related crime, the annual rate is 10.5 incidents per million trips, compared to an objective rate of 9.0.

Employee lost time injuries during July-December 1985 resulted in a loss of 0.56% of all hours worked. This compares to a lost-time objective of no more than 0.50%.

One of BART's safety objectives for FY 1985/86 is to conduct an average of one emergency procedures/safety session each month with representatives of local fire departments and other emergency service providers. During the first half of the current fiscal year, BART conducted 5 of these sessions which involved 143 fire department representatives. These sessions include: 1 system familiarization tour, 3 smoke movement drills, and 1 emergency procedures training exercise on aerial structure.

Other activities in the area of patron safety include the continued testing of materials for the Platform Edge Detection Project which is designed to improve safety for vision impaired patrons. The platform edges at Berkeley, Montgomery, and Rockridge stations have been grooved and re-filled with a slightly raised material for easier edge recognition. Additionally, a rubber-tile surface was installed at the Lake Merritt Station platform edges. This project and the Elevator Modification project have been identified as part of improving access to BART by elderly and handicapped persons. Modifications to elevators at Berkeley and El Cerrito del Norte Stations being implemented this fiscal year include: lowering control panels and telephones to accommodate patrons in wheelchairs, and installing communication and a card-reader devices. Additional details for these projects are provided under System Access on page II-52.

FUTURE OUTLOOK

Patron accidents have held fairly steady over the past five years, with 12-month totals fluctuating between 850 and 1,100 incidents. Corresponding accident rates range from a low of 15.8 accidents per million trips to a high of 19.1 (versus an annual rate of 17.3 accidents per million trips as of December 1985). Given this relatively flat profile, BART's 12-month patron accident rate is expected to remain favorable relative to the current year's objective of 17.7 accidents per million passenger trips. This, however, assumes that the number of accidents will decrease in proportion to the decrease in ridership which is expected as a result of the January 1, 1986 fare increase.

BART's patron-related crime rate is currently substantially higher than the desired objective. The upward trend for the 12-month average rate which began in early 1982 appears to have leveled off beginning in mid-1984. The 12-month patron-related crime rate since June 1984 has fluctuated between 23.0 and 24.1 incidents per million trips. This trend generally corresponds to the leveling of disorderly conduct incidents which also started in mid-1984. Whereas, incidents of disorderly conduct constituted a growing percentage of all patron-related crimes for the past 2 1/2 years through mid-1984, this trend appears to have reversed as evidenced by 1985 data. The percentage of disorderly conduct incidents to all patron-related crimes in 1982, 1983, and 1984 was: 41.2%, 52.6%, and 61.2%, respectively. This compares to 55.9% for 1985. Despite this leveling, the rates for incidents of disorderly conduct, all other patron-related crimes, and total incidents, remain well above the District's objectives, as noted in the "Objective Status" section.

The District's employee lost-time rate is currently 12% above the desired objective level of 0.50% of all hours worked. This objective could be achieved by year's end given diligent efforts in the second half of FY 1985/86. Future efforts will need to continue to enhance the District's job training program to maintain favorable performance in this area.

The District's emergency preparedness/safety session objective could be achieved this year if seven sessions are conducted in the remaining six months (one more than called for under the current objective). BART's Safety Department is involved in an intensive on-going program with local emergency service providers for the purpose of maximizing response capabilities to events on the system.

Completion of important emergency preparedness and life safety improvements which will permit BART to operate safely under higher density train operations is essential. Providing a new Daly City Turnback, ICS, C-cars, and other capacity projects alone will not permit the operation of closer headway service. A critical element is the removal of the currently imposed CPUC subway vent separation requirement. This can only come about through the completion of the District's vehicle fire-hardening program (programmed for completion in October 1986) followed by timely CPUC authorization to eliminate the vent separation requirement.

PLANNED IMPROVEMENTS

Efforts in the area of safety and security will continue to concentrate on minimizing incidents of patron-related crime and accidents for both patrons and employees.

The effective deployment of BART police will be the prime strategy for combating crime on trains, in station areas, and along track rights-of-way. Computer programs for tracking and dispatching police officers will continue to be used, as well as other information systems for the accurate and timely reporting of crime data.

In the area of patron safety and property protection, efforts will continue to focus on the District's comprehensive emergency preparedness and life safety program in order to minimize the risks to BART riders. Expansion of system capacity will require the removal of the CPUC imposed subway vent separation requirement so that trains may operate closer together throughout the system. The completion of the vehicle fire hardening program, currently estimated for October 1986, is an important project for improving fire safety and a prerequisite for eliminating this capacity restraint. Under this project, all vehicle floors will be improved and ceiling liners will be replaced to reduce flammability and toxic smoke emissions.

In addition to vehicle safety improvements are those for wayside facilities required for improving passenger safety and property protection. To date, wayside safety projects in excess of \$3 million have been identified based on recommendations contained in the Gage Babcock Wayside Safety Study (completed in June 1982) and those of the District Wayside Task Force, which is composed of BART safety staff, representatives of Gage Babcock consultants, local fire departments, and others. These projects fall into four categories of improvements: critical life safety, important life safety, primary property protection, and less important property protection.

An additional project is the Regional Rail Transit Emergency Training Program which will involve approximately 4,500 participants from BART and local fire departments. This program will provide classroom instruction, simulated emergency drills, and other techniques for the purpose of improving emergency preparedness and response times.

The completion of these safety improvements by 1987 and others soon to be identified will provide increased levels of safety and emergency preparedness. This will permit BART to operate closer headway service while maintaining stringent safety standards. Capital projects addressing improved BART safety and security are identified in Figure II-12 beginning on page II-62.

PROGRAM AREA OBJECTIVES

Updated operating performance for safety and security are identified in Figure II-3 on the following page.

Figure II-3

SAFETY AND SECURITY PERFORMANCE OBJECTIVES

FY 1986/87

1. Continue to provide an environment for patron circulation through trains and stations such that the accident rate does not exceed 17.7 per million passengers.
2. Reduce the total annual amount of employee lost time due to injuries as a percent of time worked to 0.50% or less.
3. Conduct a minimum of one emergency plan exercise per month involving emergency response agencies.

FY 1987/88 to 1990/91

1. Maintain a rate of patron-related crime below those for District communities and other transit systems in the Bay Area and in other metropolitan areas.

PROGRAM AREA D: PATRONAGE AND TRAVEL PROMOTION

Use of the BART system increased steadily over the years, until mid-1985. As indicated in Table I-1, growth rates generally exceeded 5% until that time. Since then, growth during the two quarters prior to the January 1, 1986 fare increase averaged less than 2% annually. (A comprehensive discussion of potential demand appears in Chapter I.)

A number of factors may have influenced this change in growth rates. Since mid-1985, construction of two capacity expansion projects, the Daly City Turnback and the KE Track, appears to have impacted BART service quality adversely. In addition, gasoline prices were falling concurrently. Finally, BART peak period capacity has been limited for over two years by a lack of any additional revenue vehicles. These three factors probably caused the observed flattening out of patronage growth.

Ridership surveys indicate that BART patrons are representative of the area wide population generally, and are not confined to any one socio-economic bracket. Commuting to work and work related travel comprise over 70% of BART trips. But use of BART for non-work purposes, especially shopping and access to entertainment facilities is on the upswing.

Future growth potential is expected to be good once BART capacity is increased. Expansion of office development in the central business districts of San Francisco and Oakland continues to support a growing employment, and commuting, market in these areas. In addition, significant transportation capacity improvements in corridors served by BART are not expected during the planning period. Traffic congestion on the San Francisco-Oakland Bay Bridge is significant, and parking in the City is either expensive or hard to find. Finally, BART plans to improve its access capacity as well as its train capacity. These three factors should sustain BART growth into the future.

For planning purposes during implementation of the Capacity Expansion Program, lower growth rates have been assumed in this update relative to the previous plan. This seems warranted in view of the recent decline in growth rates, uncertainty regarding gasoline prices, and the limits on BART's ability to transport more riders until the the Capacity Expansion Program is completed.

FY 1985/86 OBJECTIVE STATUS

With the majority of peak period trains operating above a 1.30 load factor in the peak direction, offpeak and reverse commute travel continue to be the primary targets for BART promotional efforts. Activities during the July-December 1985 period were coordinated with major Bay Area events including those held at the Oakland Coliseum (A's and Warrior's games, Ice Capades, Bruce Springsteen concert, etc.), the Bridge-to-Bridge foot race and Mexican Independence Day parade in San Francisco, and numerous other events in the East and Westbay.

The Thanksgiving-Christmas holiday season served as a focal point for intensifying the District's "BART Goes Shopping, Too!" campaign. In support of this offpeak marketing effort, BART provided direct Transbay service on the Richmond and Fremont lines on each Sunday between Thanksgiving and Christmas (the third consecutive year for this service). Four "Shopper's Specials" departed both Richmond and Fremont terminal stations at 40-minute intervals between 10 AM and noon destined for San Francisco/Daly City. Direct Transbay service back along the Richmond and Fremont lines was timed to retail store closings with these eight special trains (four on each route) departing Daly City between 4:30 and 5:30 PM. Operation of the "Shopper's Specials" was in addition to regularly scheduled 20-minute interval Sunday service on the Concord/Daly City and Richmond/Fremont routes. The eight "Shopper's Special" trains averaged approximately 2,600 trips on each of the four Sundays they were in operation. This is the same level of use for this special service as recorded last year.

In an effort to increase travel convenience and promote additional ridership, the BART Board of Directors approved in August 1985 a six-month test calling for an extension of weekday Transbay service on the Richmond/Daly City and Fremont/Daly City routes. The extended Transbay service began on September 9 with a weekday schedule calling for the last San Francisco-bound (no-transfer) trains on these two routes to depart their Richmond and Fremont terminal stations at approximately 7 PM (versus 6 PM as specified in the published schedule). These same last trains are scheduled to depart downtown San Francisco stations at approximately 8:30 PM (versus 7:30 PM previously), providing Transbay service back along their respective routes. After this time, systemwide service is provided on the Concord/Daly City and Richmond/Fremont routes. Ridership response to this service increment did not reach the breakeven level target during the test and therefore the extra service was cancelled effective March 7, 1986.

Additional promotional activities during the July-December 1985 period include the availability of the second edition of the Bay Area Transit Directory (published by a private firm and provided free at all BART stations), the availability of an updated "Fun Goes Farther on BART" brochure, and expansion of Bay Area teleguides to include all downtown San Francisco stations.

Total ridership of 30,812,393 for the first six months of FY 1985/86 is 2.6% below a forecast of 31,631,900, and 2.0% above the 30,197,406 trips for the same period a year earlier. This year's figure includes a 3,343,203 BART/MUNI Fast Pass trips, a 25.4% increase for Fast Pass BART travel relative to July-December 1984. This

TABLE II-2
BART/MUNI FAST PASS USE
QUARTERLY AVERAGES SINCE START-UP

<u>Quarter</u>	<u>Total Trips</u>	<u>Average Weekday</u>	<u>Average Saturday</u>	<u>Average Sunday</u>
Apr-Jun 1983	942,929	13,325	4,491	2,265
Jul-Sep 1983	1,078,848	15,215	5,215	2,387
Oct-Dec 1983	1,221,632	17,509	5,964	2,904
Jan-Mar 1984	1,279,123	18,180	6,540	2,984
Apr-Jun 1984	1,263,240	17,760	6,295	3,022
Jul-Sep 1984	1,225,981	17,340	5,649	2,953
Oct-Dec 1984	1,440,707	20,605	7,479	3,606
Jan-Mar 1985	1,587,704	22,935	8,194	3,896
Apr-Jun 1985	1,729,086	24,327	8,677	4,053
Jul-Sep 1985	1,676,683	23,655	8,358	3,763
Oct-Dec 1985	1,666,520	23,956	8,283	3,223

substantial increase is due, in part, to the monthly Fast Pass price reduction from \$24 to \$20 which took effect in October 1984. Currently, 10.9% of all BART trips are made with a Fast Pass.

Average weekday ridership increased 1.0% from an average of 210,494 for July-December 1984 to 212,511 for the same period in 1985. The current average is 3.8% below a forecast of 220,922 average weekday trips. For similar reasons as cited above, year-to-date average weekday Fast Pass usage increased 25.7% from 18,932 during July-December 1984 to 23,803 currently. An estimated 25% of the 100,000 people who attended two Bruce Springsteen concerts at the Oakland Coliseum took BART to the event. This resulted in approximately 25,000 additional trips on each of the two concert days. A new average weekday ridership record was established on Wednesday, September 18, 1985, the day of the first concert, with 238,866 trips. This was topped on Thursday, September 19, 1985, the day of the second concert, with 240,292 trips. This and other BART ridership records are summarized in Table II-3 on page II-22.

Year-to-date ridership for the four peak hours increased 0.5% from 103,884 last year to 104,455. The current average is 7.3% below a forecast of 112,626 peak period trips. Weekday offpeak patronage increased 1.2%, from 106,611 for the first 6 months last fiscal year to 108,056. The current average is 0.3% below a year-to-date forecast of 108,401 weekday offpeak trips, relative to the District's 3% marketing objective for additional (above forecast) offpeak system usage.

Year-to-date Saturday ridership averaged 90,274 trips, 5.8% above last year's average for the same period of 85,322. The current average is 6.0% above a year-to-date Saturday forecast of 85,181, twice the 3% above forecast marketing objective.

Holiday shopping, which traditionally intensifies the last two or three weeks before Christmas, helped push Saturday ridership 17.2% above forecast for December. Additionally, a new Saturday ridership record was set on November 9, 1985, the day of the U.C. Berkeley/U.S.C. football game in Berkeley. Saturday BART/MUNI Fast Pass usage increased 22.7% from an average of 6,781 during July-December 1984 to 8,320 currently (or 9.2% of systemwide Saturday ridership).

Year-to-date Sunday ridership decreased 0.2% relative to July-December 1984. The current average is 50,317 Sunday trips, down slightly from a year-to-date average last year of 50,414. The current average is 1.3% above a forecast of 49,654, relative to the District's 3% marketing objective for Sunday system usage. For the Sundays between Thanksgiving and Christmas, when the "Shopper's Special" trains were provided, Sunday ridership averaged 52,833 trips. This is slightly higher than the 52,693 average recorded for the Sundays during the 1984 holiday season. Average Sunday BART/MUNI Fast Pass trips increased 6.9% from 3,267 during July-December 1984 to 3,493 for the current 6-month period (or 6.9% of average Sunday ridership).

Monthly surveys for the first 6 months of this fiscal year indicate 93.2% of all station area facilities are at or above the standards established for cleanliness. This surpasses the 90% cleanliness objective and is just under 93.3% which was reported for July-December 1984. Similar surveys for car cleanliness indicate that 82.1% of all evaluations for carpets, seats, windows, walls, and ceilings were either at or above desired standards for the July-December 1985 period. This compares to an objective of 90%. Although not specifically called out in this year's objectives set, the Car Cleaning and Exterior Restoration Project (which began in April 1985) was completed in March 1986. Under this project, all 440 BART cars were restored to their original silver-aluminum appearance and all logos and car numbers replaced.

Patron complaints regarding public contact employees totalled 253 during July-December 1985, 2.3% below the 259 complaints received during the same 6 month

TABLE II-3
BART PATRONAGE RECORDS
As of December 31, 1985

<u>HIGHEST DAYS</u>	
Monday, July 16, 1984	235,244
Tuesday, July 17, 1984	229,055
Wednesday, September 18, 1985	238,866
*Thursday, September 19, 1985	240,242
Friday, April 12, 1985	231,745
Saturday, November 9, 1985	108,303
Sunday, July 15, 1984	77,434
<u>HIGHEST MONTHLY WEEKDAY AVERAGE</u>	
April 1985	216,155
<u>HIGHEST WEEKLY AVERAGE (Weekdays Only)</u>	
July 16-20, 1984	226,989
<u>HIGHEST MONTHLY TOTAL TRIPS</u>	
October 1985	5,404,565
<u>HIGHEST 12-MONTH TOTAL TRIPS</u>	
January 1985 through December 1985	61,413,406

* All-time record day.

period last year. The year-to-date patron complaint rate regarding public contact employees declined from 8.58 complaints per million passenger trips last year to 8.21 currently. This compares favorably to a District objective rate of no higher than 8.75 complaints per million trips.

The District's objective for on-board service announcements is to achieve a 95% rating based on the Passenger Services Sampling Survey. Ratings are derived by weighting the percentages which reflect the on-board service announcements actually made versus those required (announcements are for arrival stations, transfer points, delays of 1-5 minutes, and delays more than 5 minutes). Because this survey is conducted on an annual basis each May, current year-to-date data are not available. The rating based on the May 1985 Passenger Services Sampling Survey was 91.1%, up from 89.2% in May 1984.

FUTURE OUTLOOK

Lack of growth of peak period ridership, which is attributed to on-line capacity constraints, limited station parking, a lowering of gasoline prices, and other factors discussed in Chapter I is expected to result in year-end performance below budget relative to the peak four-hour ridership objective for FY 1985/86. Year-to-date peak four-hour train ridership is running 7.3% under budget. Actual ridership versus forecasts for the latter half of the fiscal year (which was based on relatively conservative assumptions reflecting the impact of the January 1, 1986 fare increase), may bring the annual average closer in line with budget.

As a result of below budget peak ridership, which traditionally constitutes approximately one-half of all weekday trips, BART's average weekday ridership is also below budget (by 3.8%). Offpeak weekday ridership is almost on target, just 0.3% below the desired level. Achievement of BART's average weekday ridership objective for FY 1985/86 thus appears to be more dependent upon peak ridership response following the January 1986 fare increase relative to budget.

While the fare increase is expected to have a greater impact on discretionary travel (i.e.: most of BART's offpeak trips), strong year-to-date performance for Saturday ridership (at 6.0% above forecast) should lead to achievement of BART's Saturday patronage objective, and quite possibly the 3% above forecast marketing objective.

Achievement of BART's Sunday ridership objective is also likely by year's end. However, since the current Sunday average is only 1.3% above forecast, the probability of attaining the 3% above forecast marketing objective for Sunday appears considerably less likely relative to Saturday. Strong patronage response to major events served by the system which are held on Sundays, such as the A's games and Bay-to-Breakers during the fourth quarter, could assist in increasing Sunday ridership further above forecast.

It is anticipated that Patronage and Travel Promotion objectives for station cleanliness and patron complaints regarding public contact employees will be achieved this year. Improved performance with respect to car cleanliness will be required during the second half of the year in order to achieve this objective, however.

Based on the last two annual Passenger's Services Sampling Surveys (which indicated below objective performance), improved performance will be required with regard to on-board service announcements in order to achieve a 95% rating for the May 1986 survey.

PLANNED IMPROVEMENTS

The realization of BART demand forecasts is greatly dependent upon the District's ability to provide an acceptable quantity and quality of service at a given fare level. Within its 13-year operating history, the District has made very substantial improvements in both service capacity and quality while minimizing the impacts of required fare increases. And, as patronage records reveal, public response has been very favorable with sharp increases in ridership occurring with each major service improvement.

As highway congestion continues to increase and automobile operating costs rise, demand for BART service will expand. To maintain high quality service under these conditions will require the timely implementation of essential capital improvements identified in this plan.

Until substantial increases can be provided for peak period capacity in the primary demand direction, promotional efforts will continue to focus on attracting additional offpeak and reverse commute ridership. Strategies will build upon the information base established by the Passenger Profile and Latent Demand Surveys. Efforts in the area of patronage and travel promotion will subsequently focus on realizing demand forecasts through programmed service improvements and effective marketing strategies focusing on specific market segments, such as BART travel for shopping purposes. This includes the introduction of additional inter-operator passes, improved system signage and transit information, and innovative ways to improve transfers between BART and other transit systems. Additionally, train and station area cleanliness, public contact employee helpfulness and courtesy, and service announcement accuracy will be continually monitored to assure acceptable performance is also being achieved.

Capital projects which are in support of achieving increased ridership, and realizing a greater portion of BART's potential, are identified in Figure II-12 beginning on page II-62.

PROGRAM AREA OBJECTIVES

Revised operating performance objectives for this program area identified in Figure II-4 on the following page.

PROGRAM AREA E: FINANCIAL AND OPERATIONAL EFFICIENCY

As discussed in Chapter I (see page 1-34), cost effectiveness and productivity are integral to overall financial performance and the economics of provided expanded levels of service. Continuous monitoring of expenses for all phases of operations and capital project development, in conjunction with stringent budgetary controls, have enhanced District financial performance. Additionally, improved management information systems have permitted the District to respond more quickly to changing operational requirements.

These efforts to improve BART productivity have, in real terms, resulted in declining costs per passenger, per passenger mile, and per vehicle mile over the past six and one-half years. This is shown by the constant dollar comparisons on pages I-37 and I-38. At the same time, BART patronage and vehicle miles per equivalent employee have risen. This is solid evidence of BART productivity. Additional gains in the future may be harder to attain, thus management efforts should be focused on strategies to hold the line on expense, and to evaluate new ways of allocating

Figure II-4
PATRONAGE AND TRAVEL PROMOTION PERFORMANCE OBJECTIVES

FY 1986/87

1. At a minimum, achieve normal growth projections for average daily patronage as follows (in 1,000's):

	<u>Jul-Sep</u>	<u>Oct-Dec</u>	<u>Jan-Mar</u>	<u>Apr-Jun</u>	<u>FY 86/87</u>
Average Weekday:	207.3	205.6	207.8	211.3	208.0
4-hour Peak:	103.6	103.0	104.4	105.8	104.2
Offpeak:	103.8	102.6	103.4	105.5	103.8
Saturday:	91.0	92.5	93.9	95.5	93.2
Sunday:	48.9	49.4	49.9	50.3	49.6

2. In addition to the above, actively promote offpeak ridership to achieve a 3% increase in travel as follows (1,000's).

	<u>Jul-Sep</u>	<u>Oct-Dec</u>	<u>Jan-Mar</u>	<u>Apr-Jun</u>	<u>FY 86/87</u>
Weekday:	3.1	3.1	3.1	3.2	3.1
Saturday:	2.7	2.8	2.8	2.9	2.8
Sunday:	1.5	1.5	1.5	1.5	1.5

3. Continue a sampling procedure to evaluate train and station area cleanliness, and maintain train and station cleanliness at or above an evaluation rating of 90%.
4. Continue concern for customer relations among public contact personnel such that the rate of patron complaints about this issue remains below 8.75 per million trips.
5. Continue public announcement procedures and practices such that the rating for four categories of announcements in the Passenger Services Sampling Survey averages at least 95%.
6. Complete installation of prototype passenger information panels at 12th Street/City Center Station.
7. Begin Regional Transit Association (RTA) passenger information panels project at BART stations.
8. In addition to existing bank ticket outlets, increase tickets-to-go outlets to 125 by June 1987.

FY 1987/88 to FY 1990/91

1. Maintain acceptable quality of service as reflected by accuracy of service announcements, employee helpfulness, and station cleanliness in support of achieving the following patronage levels (in 1,000's):

	<u>FY 87/88</u>	<u>FY 88/89</u>	<u>FY 89/90</u>	<u>FY 90/91</u>
Average Weekday:	214.8	218.5	227.2	237.0
4-Hour Peak:	106.0	108.1	115.3	120.4
Offpeak:	108.8	110.4	111.9	116.6
Saturday:	94.8	98.5	102.1	108.8
Sunday:	51.9	52.5	53.3	55.3

2. In addition to FY 1986/87 ticket outlets, tickets-to-go outlets by 25 each fiscal year.

resources in light of potential revenue returns. BART's Productivity Improvement Program (PIP) reflects this concern. The status for BART's 1985 PIP is summarized in Figure II-5. A more complete discussion is presented in Appendix B (under separate cover).

The availability of key financial and operational performance data is an essential element required for effective management and decision making in order to realize greater levels of efficiency. Timely and accurate information reporting has thus played a vital role in evaluating BART performance and identifying specific areas requiring improvement. In addition to the annual Five Year Plan, seven regularly published reports serve as important sources of financial and operational information. These are as follows:

Monthly Patronage: Presentation of BART ridership data for calendar and budget periods, relative to forecast. Other data include passenger miles, average fares, and average trip distance.

Budget Performance Report: Documentation of monthly and year-to-date expenses, revenues, and financial assistance for operations relative to adopted budget. Also attached are brief explanations of significant revenue/expense variations to budget.

Quarterly Financial Statement: Documentation of District assets, liabilities, capitalization, financial operating results, and debt service funds.

Quarterly Performance Report on System Objectives: Status of District operating performance objectives, priority capital projects, and program area highlights.

Quarterly Operations Performance Report: Detailed documentation of operations performance with emphasis on reliability.

Quarterly Affirmative Action Report: Documentation of progress toward achieving the District's workforce representation and Minority Business Participation objectives.

Annual Report: Highlights of each fiscal year, including those for operations, capital improvements, and year-end financial statements.

In support of making these documents available in a timely manner, BART is continuing to upgrade its management information systems in order to provide improved data storage, manipulation, and reporting capabilities. The improvements made to date address a wide range of District concerns including financial, train operations, inventory control, labor and crime reporting.

FY 1985/86 OBJECTIVE STATUS

Six financial and operational efficiency objectives were adopted by the District Board of Directors for FY 1985/86. In addition to these are other objectives which have been identified as part of the District's FY 1985/86 Productivity Improvement Program. Status for the PIP objectives is summarized in Figure II-5 on page II-27.

Favorable labor and non-labor expenses are recorded for the first half of FY 1985/86, at 1.6% and 8.7% below budget, respectively. Total operating expense for the July-December 1985 period remains 4.1% under budget. Below forecast ridership, however, has resulted in total net passenger revenue 3.2% unfavorable to budget.

Net passenger revenue covered 42.7% of total operating expense for the first half of the current fiscal year, compared to an annual objective of 48.0%. This objective reflects a higher level of fare generation, in accordance with the 30% average fare increase starting January 1, 1986, relative to the level of passenger revenue capable

FIGURE II-5
STATUS FOR BART'S 1985 PRODUCTIVITY IMPROVEMENT PROGRAM OBJECTIVES
(As of December 1985)

PIP ELEMENT	FY 1985/86 OBJECTIVE*	JUL-DEC 85 STATUS		COMMENTS
Comprehensive Marketing Program (Short-Term)	Average Weekday Offpeak Trips (109,600)	108,056		** 104,100
	Average Saturday Trips (89,800)	90,274		** 84,200
	Average Sunday Trips (51,600)	50,317		** 48,400
	Rail operating cost per passenger mile (18.5¢)	18.5¢		** 18.8¢
	Rail farebox ratio (43.0%)	42.7%		** 51.4%
	Rail passenger revenue per seat-mile (3.3¢)	3.0¢		** 3.5¢
	Offsite ticket sales outlets -- number by year end (168)	139		(No Revision)
Capacity Expansion Program (Long-Term)	Targeted Project Completion Dates and Milestones for the Following Projects	Currently Scheduled Completion		
		Total Project	Milestone	
	KE Track (November 1985), project complete by November 1985	Mar 86	Mar 86	
	New ATC Prototype (October 1985) Production release by October 1985	Mar 86	Mar 86	
	Vehicle Fire Hardening (September 1986), Complete 420 Cars by June 1986	Oct 86	407 Cars by Jun 86	Contractor delay.
	Integrated Control System, Phases I & II (Phase I = January 1987, Phase II = December 1987), complete software production by April 1986	Oct 87	Feb 87	Project consolidated in Sep 85
	Second Generation Transit Vehicles (schedule under review), prototype delivery by August 1985	May 87	Oct 85	Four cars delivered in Oct 85
	Daly City Turnback (December 1987), complete civil construction by April 1986	Dec 87	Apr 86	
	Daly City Yard (March 1988), complete design by November 1985	Mar 88	Nov 85	

* Objectives are consistent with those reported to the RTPC in September 1985 based on the District's Draft FY 1985/86 Budget.

** Revised objectives are based on final adopted budget which includes the impact of the January 1986 30% fare increase.

of being generated under the fare structure in effect prior to that date. For the same reason, BART's rail farebox ratio was 45.9% during July-December 1985, compared to a 51.4% objective. Express bus farebox ratio averaged 13.1% versus a 17.1% objective.

Despite below forecast ridership, favorable operating expense resulted in a rail cost per passenger mile of 18.4¢ compared to an objective of 18.8¢ for the entire year.

The number of vehicle miles produced per equivalent District employee is within 4.2% of the desired level for the first half of the year, 15,708 actual versus 15,054 objective.

Year-to-date system utilization (passenger miles per seat mile, or average seat occupancy rating) is 35.9%, just under an objective of 36.5%.

Employee paid sick leave is also slightly unfavorable with year-to-date rate of 3.55% (sick hours paid to straight time hours paid) versus an objective of 3.5%.

Data continues to be collected and evaluated as part of the District's ongoing performance monitoring and assessment efforts. Key documents have been prepared and transmitted to the District Board of Directors, Department Managers, and other appropriate staff and outside agencies. The number of actual versus objective production days for each document thus far this year are as follows: Monthly Patronage Reports (10.3/10), Monthly Budget Performance Reports (14.0/15), Quarterly Affirmative Action Report (20.0/15), Quarterly Financial Statement (35.5/25), Quarterly Performance Report on System Objectives (36.5/35), and Quarterly Operations Performance Report (45.0/45).

FUTURE OUTLOOK

A key factor which will impact performance with respect to the District's farebox ratio objectives (for rail, express bus and total operation) is ridership response to the January 1, 1986 fare increase. Based on year-to-date performance, the level of erosion would have to be less than forecast (i.e.: ridership would have to be above forecast) in order to offset below budget ridership and passenger revenue during the first half of FY 1985/86.

On the expense side, rail cost per passenger mile is at a favorable level, and all indications are that this objective should be achieved for the year.

Performance with respect to vehicle miles per equivalent employee, system utilization, and employee paid sick leave also is favorable, all within 3 to 4 percentage points of desired levels. Assuming slight improvement for these productivity indicators during January-June 1986, all these objectives should be achieved by year's end.

Performance with respect to key report availability varies widely. The Monthly Patronage Report, Budget Performance Report, Quarterly Performance Report on System Objectives, and Quarterly Operations Performance Report have been made available either as planned or within 5 percentage points of the desired availability objectives. As a result, the objectives for these reports will in all likelihood be achieved for the year. Availability objectives for the Affirmative Action Report, Quarterly Financial Statements, and the Annual Report do not appear to be achievable this year.

Improved financial performance during the current SRTP timeframe is to be realized through stringent budget controls in concert with implementation of strategies to increase productivity. In support of this effort will be the timely availability of key financial and operations reports which permit BART management and the Board of Directors to be responsive to District needs and opportunities. Simultaneous

improvements already noted in such areas as reliability, service delivery (throughput), and financial effectiveness attest to the gains BART has made in its 13 year operating history.

PROGRAM AREA OBJECTIVES

Updated operating performance objectives for this program area are identified in Figure II-6 below.

Figure II-6

FINANCIAL AND OPERATIONAL EFFICIENCY PERFORMANCE OBJECTIVES

FY 1986/87

1. Maintain a funded budget and farebox ratio of no less than 13.6% for BART express bus operations and 52.3% for rail operations.
2. Maintain a rail cost per passenger mile of 20.5¢ or less.
3. Achieve a level of service output such that 14,686 vehicle miles are produced per equivalent District employee (based on 2,000 hours worked, including overtime and excluding capitalized labor).
4. Improve system utilization (passenger miles per seat mile) to 35.7% through continued monitoring of train capacity to match passenger demand patterns.
5. Maintain a paid sick leave rate of no more than 3.5% (9.1 paid days) annually per employee.
6. Transmit key performance reports to the Board of Directors, Department Managers, and/or other recipients within the following number of working days after the close of each reporting period: Monthly Patronage Report (10), Monthly Budget Performance Report and Quarterly Affirmative Action Report (15), Quarterly Financial Statements (25), Quarterly Performance Report on System Objectives (35), Quarterly Operations Performance Report (45), and the Annual Report (75).

FY 1987/88 to FY 1990/91

1. Continue to provide cost-effective and efficient service through the achievement of key financial and operational efficiency objectives.

PROGRAM AREA F: AFFIRMATIVE ACTION

The purpose of the District's Affirmative Action Program is to formalize efforts to provide equal employment opportunity to all qualified persons, including minority/ethnic groups and women, and to assure that business enterprises owned by minorities and women are afforded the maximum practical opportunities to participate in the performance of all District contracts. The intent of the program is also to improve methods of resolving equal employment opportunity problems in accordance with federal and state legislation. The overall goals of BART's affirmative action program are:

- o To use Affirmative Action to achieve a District workforce at all job levels in which minorities and women are represented in proportion to their representation in the population of the BART District.
- o To increase opportunities for participation of disadvantaged and women-owned business enterprise in District contracting.

BART's Affirmative Action Plan (adopted by the District Board of Directors in June 1983) includes programs to achieve 3-year workforce representation objectives for women and minorities. The objectives were developed based on population characteristics for the three-county District per the 1980 U.S. Census and address representation within 15 job groups. Important elements of the plan are a job training program to promote the upward mobility of women, including placement within nontraditional jobs and for minorities in all job classifications and a classification maintenance program study that will determine the general availability of upward mobility opportunities within the District. Also included in the plan are a targeting process and an intensified community outreach program for the purpose of improving the availability of information regarding employment opportunities at BART.

BART's Minority Business Enterprise Program (adopted by the District Board of Directors in February 1984) includes procedures to attain practical participation goals for disadvantaged- and women-owned businesses in all District contracts, and for joint development opportunities.

Title VI

In compliance with Title VI (Civil Rights Act of 1964), BART submits to UMTA an assessment of rolling stock characteristics and distribution, a service area demographic profile, and service accessibility to specific minority and nonminority communities. A full assessment is submitted every 10 years based on most recent Census data. Interim updates are prepared annually reflecting service and/or fare revisions.

The District's 1983 submittal was based on 1980 census data which was used to prepare a profile of the service area including: population, median family income, civilian labor force, population trends, and automobile ownership. Profiles were prepared for both minority and nonminority populations as well as the total service area population.

A sample of 1,636 trip destinations were utilized in an analysis of travel time and costs for minority and nonminority analysis zones (based on Census tracts). Seven trip categories are included in the analysis. These are: employment, shopping, hospitals, social services, judicial courts, education, and central business district (includes downtown San Francisco and Oakland only). Based on 1980 data, the total population for BART's service area is 2,539,385. This represents a population increase of 4.2% since 1970. Contra Costa County population increased 17.6%, the highest gain for all BART's counties.

The minority population represents 37.8% of BART's total service area. The breakdown by minority group is: Black 14.2%, Asian 11.6%, Hispanic 11.3%, and Native American 0.7%. Since 1970, the greatest population increases were 89.3% for Asian and 64.5% for Native American. Black population increased 18.8% with a 2.9% increase for Hispanics.

The total civilian labor force for BART's service area is 1,296,241. Minority labor force representation is: Black 11.8%, Asian 11.7%, Hispanic 10.3%, and Native American 0.4%.

Median income for BART's service area is \$21,355. Minority group median income is Asian \$23,897, Hispanic \$19,972, Native American \$17,948, and Black \$14,954. Median income for Blacks residing in San Francisco is \$14,269, the lowest minority median income for all counties, while Asians in Contra Costa County have the highest minority median income at \$28,778.

The percent of service area households without an automobile is 18.3%. The Black population has the highest percentage of households without an automobile at 30.5% followed by 22.6% for Asians, 21.4% for Native Americans, and 18.9% for Hispanics.

The most important part of the Title VI assessment is the measurement of travel times and travel costs from a sample of analysis zones which are characterized as predominately minority and non-minority. UMTA establishes travel time standards for specific trip categories (the first six previously listed above). Accessibility is then assessed based on whether selected trips can be made within the accepted standards.

An analysis of accessibility within BART's service area was performed with respect to two sets of transit networks: all transit including BART, and all transit not including BART. The analysis focused on the relative effectiveness of each transit network in accommodating travel between minority/nonminority analysis zones and selected trip destinations (corresponding to the UMTA categories plus trips to downtown San Francisco and Oakland).

The results of this analysis in terms of accessibility and costs are summarized in Table II-4, below.

TABLE II-4
TITLE VI: ACCESSIBILITY AND FARE ANALYSIS

STANDARD TRIP CATEGORY (PURPOSE)	PERCENT OF ALL DESTINATIONS ACCESSIBLE WITHIN STANDARD TIME*		AVERAGE FARE (\$) **	
	MINORITY	NONMINORITY	MINORITY	NONMINORITY
Employment	40.8	41.6	0.60	0.52
Shopping	40.8	27.8	0.54	0.57
Hospitals	33.0	33.0	0.54	0.54
Social Services	18.4	25.3	0.50	0.50
Judicial Courts	40.3	16.7	0.56	0.50
Education	47.6	33.1	0.58	0.55
SF/OAK CBD	63.5	47.3	0.72	0.81

* Established by UMTA guidelines.

** Average fares reflect the fare schedule in effect during 1980.

FY 1985/86 OBJECTIVE STATUS

As of December 31, 1985, BART's work force consisted of 2,275 full-time/active employees, of which 531 (23.3%) are women and 1,127 (49.5%) are minority. The District's FY 1985/86 Affirmative Action objective for workforce representation is to make progress towards achieving the June 1986 representation objectives for the specific job categories identified in BART's 1983 Affirmative Action Plan. The table on the following page summarizes progress towards achieving the District's work force representation objectives.

Minority and women-owned business enterprise participation for the July-December 1985 period was 16.4%, versus an objective of 21% for the entire year. For federally assisted contracts let during the first half of the year, WBE participation was 3.1%, just above BART's 3% annual objective. DBE participation for federally assisted contracts was 13.2% for the first 6 months of the year, versus an annual objective of 18%.

FUTURE OUTLOOK

Workforce representation for women and other minority groups has improved within recent years with regard to overall percentages and distribution by job group. Progress in achieving the 1986 objectives, as set forth in the 1983 Affirmative Action Plan is summarized in Table II-5 on page II-33. As indicated in the far-right column, actual representation percentages relative to the objectives have been realized in 5 out of 27 job categories (as indicated by a percentage achieved equal to or greater than 100%). The current plan applies to the period through June 1986. By January 1987, an update of the current plan will be completed which will facilitate progress toward achievement of the remaining program objectives.

In recognition of the wide fluctuation of WBE and DBE participation rates for federally assisted contracts and MBE participation based on all contracts, these Affirmative Action objectives may not be attained during the second half of FY 1985/86. In recognition of this, increased resources will be devoted to monitoring of contract opportunities and identification of qualified minority firms.

PLANNED IMPROVEMENTS

Progress towards achieving workforce representation objectives is addressed in the District's Affirmative Action Plan which includes 13 major activities, 12 of which have been completed as of the end of December 1985.

PROGRAM AREA OBJECTIVES

Objectives for this program area are identified in Figure II-7 on page II-34.

TABLE II-5
 PROCESS TOWARDS ACHIEVING BART'S 1983
 AFFIRMATIVE ACTION PLAN OBJECTIVES FOR 1986

AFFIRMATIVE ACTION GROUP AND JOB CATEGORY	PERCENT REPRESENTATION AS OF:		JUNE 1986 OBJECTIVE	PERCENTAGE POINT GAIN REQUIRED	ACTUAL	PERCENT OF OBJECTIVE ACHIEVED*
	JUNE 1983	DECEMBER 1985				
WOMEN						
Executives and Managers	3.9	5.9	10.0	6.1	2.0	32.8
Supervisors/Other	3.1	3.8	6.0	2.9	0.7	26.1
Foreworkers/Transportation	9.1	9.1	12.0	2.9	0.0	0.0
Foreworkers/Other	2.1	4.7	9.0	6.9	2.6	37.7
Engineers	5.7	7.5	10.0	4.3	1.8	41.9
Professionals	37.4	42.8	39.0	1.6	5.4	337.5
Transportation Workers-T/O	23.5	27.6	27.0	3.5	4.1	117.1
Skilled Workers	3.9	5.8	9.0	5.1	1.9	37.3
Semiskilled Workers	19.7	20.0	27.0	7.3	0.3	4.1
Protective Services	16.0	17.5	17.0	1.0	1.5	150.0
Supervisors/Police	11.5	10.3	20.0	8.5	-1.2	-14.1
HISPANIC						
Supervisor/Transportation	9.4	9.7	11.0	1.6	0.3	18.8
Supervisor/Other	4.7	5.3	6.0	1.3	0.6	46.2
Foreworker/Transportation	12.1	12.1	13.0	0.9	0.0	0.0
Engineer	1.9	2.8	5.9	4.0	0.9	22.5
Professionals	5.3	7.9	8.0	2.7	2.6	96.3
Supervisors/Police	0.0	3.4	11.0	11.0	30.4	30.9
ASIAN						
Executives & Managers	3.9	3.9	6.0	2.1	0.0	0.0
Supervisors/Transportation	6.3	6.4	7.0	0.7	0.1	14.3
Foreworkers/Transportation	4.6	4.5	5.0	0.4	-0.1	-25.0
Foreworkers/Other	9.1	10.4	10.0	0.9	1.3	144.4
NATIVE AMERICAN						
Executives & Managers	0.0	0.0	1.0	1.0	0.0	0.0
Supervisors/Other	0.0	0.0	1.0	1.0	0.0	0.0
Foreworkers/Transportation	0.0	1.5	1.0	1.0	1.5	150.0
BLACK						
Supervisors/Transportation	15.6	12.9	16.0	0.4	-2.7	-675.0
Supervisors/Other	9.4	9.9	11.0	1.6	0.5	31.3
Skilled Workers	16.2	15.8	17.0	0.8	-0.4	-50.0

* Objective achievement rating is calculated on the basis of actual percentage points gained (December 1985 actual less June 1983 actual) divided by percentage point gain required to meet objective (June 1986 objective less June 1983 actual). This ratio is then multiplied by 100 to reflect the percent of the objective actually achieved.

Figure II-7

AFFIRMATIVE ACTION PERFORMANCE OBJECTIVES

FY 1986/87

1. Complete an evaluation of District performance in relationship to the 1983/86 Affirmative Action Plan objectives for women and minorities, and develop an updated plan by December 31, 1986 to cover a five-year period.
2. Work to achieve workforce representation objectives for women and minorities in accordance with the 1983/86 plan until the update is completed, and, thereafter, in accordance with the updated Affirmative Action Plan.
3. Work to achieve 21% minority business enterprise participation for all District contracts determined to have MBE opportunities, with 18% DBE and 3% WBE participation for federally assisted contracts.
4. Work to achieve 15% equity participation in District Joint Development Projects by women and minority individuals and/or business enterprises.

FY 1987/88 to FY 1990/91

1. Seek to achieve District objectives for workforce representation of minorities and women for minority business enterprise contract activities.

PROGRAM AREA G: SYSTEM ACCESS

The original BART plan envisioned a major coordination effort and restructuring of local transit routes to provide high levels of access to rail stations. With 113,600 average weekday trips and 17,262 automobile spaces provided when Transbay service began in September 1974, BART parking facilities then averaged a 79% noontime occupancy. July-December 1985 weekday ridership averaged just over 212,500 trips with 6,310 more parking spaces provided now than in 1974. Every parking space in the system, except at Coliseum/Oakland Airport and Richmond Stations, is typically filled by 9:00 A.M. weekdays.

BART patron access needs in outlying suburban areas are difficult to serve by transit, as past experience has shown. Consequently, the automobile is the most widely used and effective means for travel to BART in these areas. As shown in Table II-6 on page II-36 the District now provides 23,572 automobile spaces at 24 stations, or 36.6% more than when Transbay service began.

Past efforts have included the implementation of innovative alternatives to parking, including: special shuttles, exclusive bus lanes in the immediate vicinity of stations, improved bus waiting areas, interoperator transfers and passes, bicycle racks and lockers, and a car-pool program. All of these have met with varying degrees of success, depending upon their location.

In addition to these access improvements, is the District's express bus service which links the current rail system to outlying areas in Alameda and Contra Costa Counties via prospective BART-served corridors. The periodic Passenger Profile and Latent

Demand Surveys have provided detailed access information for both users and nonusers of the rail and express bus system. This information has been utilized to update BART's plans for system access. Further, numerous improvements designed for the special needs of the elderly and handicapped have been implemented over the years (in addition to those originally incorporated into the system), making BART a viable form of transportation for mobility impaired persons. This includes BART Express Buses which are accessible to persons in wheelchairs. The District's Express Bus Program provides service between key BART stations and travel corridors within the District presently not served by rail.

FY 1985/86 OBJECTIVE STATUS

The District's FY 1985/86 objectives for system access focus on improving service in four areas: parking, local bus coordination, BART express bus service, and safety and mobility needs of elderly and handicapped patrons.

Included in the District's system access objectives this year is the addition of 2,826 new parking spaces at existing and planned future rail stations. This objective is based on the completion by June 1986 of five parking projects at existing stations and three park/ride facilities to be located on planned future station sites which are associated with a Pittsburg-Antioch extension. The status for these eight parking expansion projects, in support of 2,826 new spaces this fiscal year, is as follows.

Of the planned 2,826 spaces, 492 (17.4%) were opened to the public during July-December 1985 through completion of two of the four station parking lot redesign projects included in this year's objectives set. In November, 293 spaces were added at Bayfair Station, followed by the December opening of 199 spaces at South Hayward Station.

The remaining two parking lot redesign projects are scheduled for completion during the third quarter this fiscal year. These include Concord Station (204 spaces) to be completed in January and El Cerrito del Norte (514 spaces) in February.

Another parking project for South Hayward Station will provide an additional 173 spaces in a new BART-owned parking facility located across Dixon Street from the existing lot. This project is scheduled for completion by May 1986.

Progress for parking expansion at Fremont station includes the advertising for bids for a project which calls for the paving of a gravel lot, connecting the lot to the existing paved facility, and paving undeveloped BART property. Previously scheduled for completion during the current fiscal year, construction for this 405-space project is expected to begin this February with completion by October 1986.

Also called out in this year's system access objectives is the completion of the West Pittsburg (Bailey Road) and East Antioch (Hillcrest Avenue) park/ride facilities. Construction began early this fiscal year for both these projects which are to be linked to Concord Station via BART express bus service. Each facility will consist of a 200-space parking lot and adjacent bus loading areas. The East Antioch facility is scheduled for completion by March 1986 with the West Pittsburg facility to be completed by June 1986.

A third park/ride facility called out for completion in this year's objectives is the North Concord/Martinez project. This 500-space facility is to be located at the intersection of the Port Chicago Highway and SR-4 with a BART express bus link to Concord Station. Negotiations were finalized during the second quarter with the

Table II-6
BART PARKING SPACE INVENTORY
(As of December 1985)

CONCORD LINE:		
	Concord	1,771
	Pleasant Hill	1,652
	Walnut Creek	1,263
	Lafayette	1,096
	Orinda	1,096
	Rockridge	776
	SUBTOTAL	7,654
RICHMOND LINE:		
	Richmond	754
	El Cerrito del Norte	1,079
	El Cerrito Plaza	509
	North Berkeley	524
	Ashby	560
	MacArthur	690
	SUBTOTAL	4,116
FREMONT LINE:		
	Fremont	1,525
	Union City	1,166
	South Hayward	1,079
	Hayward	967
	Bayfair	1,761
	San Leandro	1,066
	Coliseum/Oakland Airport	923
	Fruitvale	787
	Lake Merritt	190
	SUBTOTAL	9,464
SAN FRANCISCO LINE:		
	Daly City	1,877
	Glen Park	58
	Oakland West	403
	SUBTOTAL	2,338
SYSTEM GRAND TOTAL		23,572

U.S. Navy (the current owners of the property) regarding a lease agreement. It is estimated that an 11-month construction period will be required once agreement is reached and work begins, which is now anticipated to occur during the latter half of the current fiscal year.

Activities addressing the District's 1985/86 objective to improve schedule coordination with AC Transit included the development of an agreement specifying the services to be coordinated. This agreement provides for continued funding of AC/BART coordinated service which was initiated in September 1984.

The District's objective for express bus service is to implement first stage streamlining in all corridors by the end of the current fiscal year. On September 9, 1985, streamlining was implemented for the UP and UL express bus routes which serve the Livermore Valley from both Bayfair and Hayward BART stations. Scheduled travel times for midday service have been reduced and service has been extended to the Hacienda Business Park. Also during the first half of the year, the BART Board of Directors authorized the implementation of first stage express bus streamlining for routes serving the I-680 San Ramon corridor. This service was begun in March 1986. As of December 1985, first stage streamlining has been authorized for all express bus corridors except I-80. Service revisions in the SR-4 and I-680 corridors are currently scheduled for implementation this winter.

The District's objective to implement an express bus flash pass was achieved during the first quarter. On July 1, 1985, patrons began using the new flash pass. The passes may now be purchased each calendar quarter and are valid for 3-months for one- and two-zone express bus travel, respectively. Effective January 1, 1986, the passes are priced at \$45 and \$69. For those who patronize BART express buses less frequently, a new 20-ticket book became available in August. The cost for non-expirable one- and two-zone books is \$15 and \$23, respectively, effective January 1, 1986.

The District's FY 1985/86 objective relating to access and safety for mobility impaired patrons is to implement and evaluate the first phases for both the Platform Edge and Elevator Modification projects. Testing was completed in November 1985 for the raised platform edges which have been installed in Berkeley, Montgomery, Rockridge, and a portion of Lake Merritt stations. Results of the tests revealed the surfaces to be readily detectable by vision impaired and blind persons. Completion of the installation of a brightly colored and textured rubber surface for platform edges at Lake Merritt Station is scheduled for January 1986, which will be followed by a further evaluation period.

The Elevator Modification Project at El Cerrito del Norte Station is expected to be completed in January 1986. In addition to the lowering of control panels in order to accommodate patrons in wheelchairs, progress continued with respect to the installation of a card-reader, intercom, closed circuit television, and new call buttons. These same improvements are being installed at Berkeley Station, but are not expected to be completed until after those at El Cerrito del Norte. Evaluation of the elevator improvements at these two stations is expected to begin during the early part of 1986.

FUTURE OUTLOOK

The 1983 BART Latent Demand Study indicates that the current potential market for typical home to work travel is approximately 462,000 people. This population includes all persons who reside within 3 miles of a BART station and commute 5 miles or more to a workplace which is also served by BART. The results of this and the

more recent 1985 Passenger Profile Study (which was conducted in May 1985) indicate that system access is clearly a growing problem. Access deficiencies are expected to become even more acute as patronage demand increases in response to service expansion phasing over the next five years.

As noted in Chapter I (see page I-19), with no significant highway expansion programmed within BART served corridors and existing facilities at or near capacity currently, BART with its capacity expansion program, is essentially the only regional transportation facility which will be capable of accommodating substantially higher travel demand in the coming decade. This is particularly true for Transbay travel and other critical highway linkages such as the Caldecott Tunnel. These facilities are at capacity during most of the day with their delay impacts extending to all proximate highways. This increasing level of highway congestion along with very limited downtown parking is expected to result in more and more people looking toward BART as a way of satisfying their travel needs. How these additional people will get to BART is the central focus of the District's programs to improve system access.

The most pressing need in the coming years will be to alleviate BART's growing parking deficiency, estimated by 1988 to be on the order of 13,800 spaces above the current 23,572 space inventory. Under the fare structure effective through December 1985, this deficiency translates into an estimated \$7.2 million annual net revenue loss as a result of access-constrained patronage growth.

Funding is, of course, a critical concern. Progress towards implementing parking expansion projects will subsequently depend upon the District's ability to secure funds through conventional sources as well as through innovative financing methods. One potential funding source is the Revenue Bond Construction Fund, created in the second quarter of FY 1985/86. In February 1986, the BART Board of Directors adopted a "Bond List" of projects to be funded from this source.

In light of the parking deficiency, and the role that access has on system patronage in general, the District must re-examine the ways in which other Bay Area Transit operations, including BART Express Bus service, can be improved to satisfy both local and BART access needs. Cooperative efforts with AC Transit and the BART/MUNI Fast Pass are a major step toward achieving higher levels of coordination of services, fares, and transfers. However, the serious parking deficiency in the Eastbay will continue to constrain ridership until BART's parking expansion program, as outlined in the next section below, can be realized.

BART also recognizes the need to continue to improve system access for mobility impaired persons. The District meets with representatives of the elderly and handicapped community on an on-going basis for the purpose of identifying improvements to increase mobility and safety in stations and on trains. In light of increased attention in this area, the District will need to continue to meet with these representatives as one effective means of improving both accessibility and safety.

Improving the availability of information for transit services in the vicinity of stations is also essential. As a result of the widespread reorganization of AC Transit and MUNI lines and the more recent phasing in of services under the Central Contra Costa Transit Authority, many station area maps located in BART stations are now outdated and need to be replaced with current information. Improvements in these areas are described below under Interoperator Coordination.

PLANNED IMPROVEMENTS

Projects programmed for implementation in the current Five Year Plan timeframe are discussed in the following sections. The improvements are divided into four basic groups, each relating to specific modes of travel or special considerations. These are: parking, BART express bus, interoperator coordination, and elderly and handicapped needs.

Parking Improvements

Table II-7 on the following page summarizes the District's parking expansion program to provide 16,766 new parking spaces at existing rail stations. This compares to an estimated 1988 shortage of 15,800 spaces. Of these 16,766 spaces, 2,929 are programmed for completion by June 1986, leaving an uncompleted balance of 13,837 spaces. The realization of this program will increase BART's district-wide parking inventory by 78%, from about 21,500 spaces in March 1983 to about 38,300.

The parking program at existing stations includes 33 projects as follows:

- o 11 Parking Productivity Improvements, primarily consisting of redesign of existing lots to accommodate more automobiles
- o 10 Surface Parking Expansion Projects
- o 12 Parking Facilities, including multi-level parking structures

BART expects to add 1,910 new spaces at existing rail stations during the 1986/87 fiscal year. These include surface expansion at Fremont (405 net new spaces) and redesign at Lafayette (220 new spaces), Orinda (150), North Berkeley (80), Fremont (250), Hayward (330), San Leandro (250), and Fruitvale (225). In addition, 545 gravel spaces will be paved at Fremont, and 500 new spaces will be constructed at the North Concord/Martinez park/ride lot, for a total of 2,955 spaces programmed in the FY 1986/87 objective. Information on the North Concord/Martinez project, and other park and ride projects is presented separately below in the Express Bus section.

Parking expansion for four additional fiscal years (through FY 1990/91) is also summarized in Table II-7. Funding from the Bond List and Federal Interstate sources has been programmed to complete 5,705 new parking spaces between FY 1987/88 and FY 1990/91. The final portion of the 16,766 space parking expansion program is currently unfunded. These additional 6,232 spaces will be scheduled for completion when funding becomes available.

BART Express Bus

The incremental express bus streamlining plan outlined in Table II-8 identifies an improvement schedule which enables local transit operators to take over the locally oriented service now being provided by BART. Since none of the local operators in the express bus corridors is in a position to take over the seven-day, 6:00 AM-to-midnight level of BART bus service being provided at this time, it is proposed that the transition be made first for weekday service, then for Saturday service, and finally late evening, weeknight, and Sunday service. Streamlining is also linked to completion of park/ride lots in the express bus corridors. As more lots are completed, express bus routes will be modified.

Table 11-7
BART PARKING PROGRAM
Incremental Parking Space Additions

	New Spaces Mar 1983 Through Dec 1985	New Spaces January Through June 1986	New Spaces Programmed FY 86/87	Funded* New Spaces Programmed FY 1987/88 to FY 90/91	Unfunded Portion of Program	Cumulative New Spaces Since Mar 1983	Completed Program Inventory
CONCORD LINE:							
Concord	1,223	204	0	600	1,200	2,552	3,775
Pleasant Hill	1,586	0	0	1,200	0	1,266	2,952
Walnut Creek	1,168	0	0	0	1,132	1,227	2,395
Lafayette	1,014	0	220	200	700	1,202	2,216
Orinda	1,083	0	82	0	500	663	1,746
Rockridge	776	0	0	0	0	776	776
SUBTOTAL	6,850	204	370	2,000	3,532	6,910	13,760
RICHMOND LINE:							
Richmond	754	0	0	200	0	200	954
El Cerrito del Norte	1,054	514	0	300	500	1,339	2,343
El Cerrito Plaza	509	0	0	150	0	150	659
North Berkeley	504	0	80	150	0	250	754
Ashtabur	487	0	0	100	0	100	660
MacArthur	487	0	0	0	650	853	1,340
SUBTOTAL	3,868	514	80	900	1,150	2,892	6,760
FREMONT LINE:							
Fremont	1,525	0	655	0	0	655	2,180
Union City	932	0	0	500	0	734	1,666
South Hayward	880	173	0	800	0	1,172	2,052
Hayward	967	0	330	300	0	630	1,597
Bayfair	1,408	0	0	80	600	1,033	2,441
San Leandro	1,066	0	250	0	0	250	1,316
Coliseum/Oakland Airport	923	0	0	250	0	1,173	1,173
Fruitvale	730	0	225	0	550	932	1,662
Lake Merritt	105	0	0	0	400	485	590
SUBTOTAL	8,536	173	1,460	2,030	1,550	6,141	14,677
SAN FRANCISCO LINE:							
Daly City	1,877	0	0	0	0	0	1,877
Glen Park	0	0	0	0	0	0	58
Oakland West	403	0	0	775	0	775	1,178
SUBTOTAL	2,280	0	0	775	0	833	3,113
SYSTEM GRAND TOTAL	21,534	891	1,910	5,705	6,232	16,766	38,310

* All projects in this column, except Pleasant Hill, are to be funded from the Revenue Bond Construction Fund List. Pleasant Hill funding is programmed from Federal Interstate funds.

EXPRESS BUS STREAMLINING PLAN

EAST CORRIDOR

TIME PERIOD	EXPRESS BUS SERVICE DESCRIPTION	PP HEADWAY	MID HEADWAY	EVE	SAT	SUN	TT	COMMENTS
Current	P- Port Chicago-Hwy to Antioch	8 daily tps	No service	-	-	-	50	30 stop locations
	P1- Port Chicago Hwy to Brentwood	1 trip	3 trips	-	-	-	73	73 stop locations
	PX- Highway 4 to Antioch	30 minutes	60 minutes	-	-	-	50	28 stop locations
	P1X-Highway 4 to Brentwood	60 minute	60 minutes	-	-	-	68	65 stop locations
	P2X-eve/w' end serv to Pitt-Brent	No service	No service	60	60	60	90	89 stop locations
March 1986	P-E Concord to Brentwood	15 minutes	30 minutes	-	-	-	60	20 stop locations
	P2X Concord to Brentwood	No service	No service	60	60	60	90	89 stop locations
Upon completion of park/ride lots	P-E Concord to Antioch	15 minutes	30 minutes	-	-	-	60	Stops only at Park/Rides at Hillcrest, Bailey Road and North Concord (and Somersville and Railroad P/R when completed).
	P2X Concord to Brentwood	No service	No service	60	60	60	90	

PP = Peak period (6:00 a.m.-9:00 a.m., 4:00 p.m.-7:00 p.m.)

MTD = Mid-day

EVE = Evening

SAT = Saturday (7:00 p.m. - 12:00 midnight)

SUN = Sunday

TT = Travel times

All times in minutes

EXPRESS BUS STREAMLINING PLAN

CENTRAL CORRIDOR

TIME PERIOD	EXPRESS BUS SERVICE DESCRIPTION	PP HEADWAY	MID HEADWAY	DAILY HOURS	ONE-WAY TRAVEL TIME	COMMENTS
Pre-March 1985	Weekday D Route - W.C. BART to Stoneridge via Dublin on I-680 Frontage Road	30 minutes	30 minutes	95	61 minutes	
	Saturday D Route - W.C. BART to Stoneridge via Dublin on I-680	45-60 min.	45-60 min.	46	61 minutes	
	Sunday D Route - W.C. BART to Stoneridge via Dublin on I-680 Frontage Road	60 minutes	60 minutes	39	61 minutes	57 stops for all levels of service
	Supplemental Service					School trips
	MX	1 AM/1 PM		3	21 minutes	
March 1985	Weekday M Route - Concord BART to Martinez via local streets	30 minutes	30 minutes	50	43 minutes	46 stops for all levels of service
	Sunday M Route - Concord BART to Martinez via local streets	60 minutes	60 minutes	27	39 minutes	
	Supplemental service					M Route trippers
	ME Express svc. via Alhambra Av., Hwy 4 & I-680-Martinez to Concord	30 minutes	No service	32	25 minutes	6 stops
	ME Saturday evening service 6 PM to midnite			12	25 minutes	Service to operate at 60 minute headways
March 1986	ME Sunday service	60 minutes	60 minutes	17	25 minutes	
	DXI freeway with some local service - Walnut Creek BART to Stoneridge. Route will also operate weekday evenings at 60 minute headways	30 minutes	30 minutes	63	40 minutes	I-680 Corridor service with Frontage Road segment between Livorna Road and Stone Valley Road and Diablo Road and Sycamore Valley Road. Also serves Bishop Ranch and Dublin. Frontage Road segments will be eliminated when freeway off-ramp bus stops at Livorna and El Cerrito are completed.
	D local service - Walnut Creek BART to Dublin, weekend service					Same routing as current D route
	Saturday Sunday	45-60 min. 60 minutes	45-60 min. 60 minutes	46 39	61 minutes 61 minutes	Same routing as current D route

Table II-8

EXPRESS BUS STREAMLINING PLAN

SOUTH CORRIDOR

TIME PERIOD	EXPRESS BUS SERVICE DESCRIPTION	PP	MID	EVE	SAT	SUN	TT	COMMENTS
Pre-June 1985	U Local Pleasanton, Livermore local service	30	30	60	30	60	55	29 stop locations
	U-L Express service Bayfair to Livermore	30	-	-	-	-	50	9 stop locations
	U-P Express service Bayfair to Pleasanton	30	-	-	-	-	40	18 stop locations
June 1985	UP Bayfair BART to Pleasanton	30	-	-	-	-	40	Revised routing via Foothill, Stoneridge, Willow, Las Positas, San Ramon, Valley, Hopyard, and Dublin Blvd.
September 1985	UL Bayfair BART to Livermore	30	60	-	-	-	50	
	U Bayfair, Pleasanton, Livermore local service	30	60	60	30	60	55	
Upon Completion of Dublin/Livermore Park/Ride	UL Bayfair BART to Livermore	15	30					

PP = Peak period (6:00 a.m.-9:00 a.m., 4:00 p.m.-7:00 p.m.)

MID = Midday

EVE = Evening (7:00 p.m. - 12:00 midnight)

SAT = Saturday

SUN = Sunday

TT = Travel times

All times in minutes

Table II-8
EXPRESS BUS STREAMLINING PLAN
WEST CORRIDOR

TIME PERIOD	EXPRESS BUS SERVICE DESCRIPTION	PP HEADWAY	MID HEADWAY	DAILY HOURS	ONE-WAY TRAVEL TIME	COMMENTS
Current	Q Express Bus service from El Cerrito del Norte to Pinole	30 minutes	30 minutes	44	35 minutes	32 current stop locations
	J Express Bus service from El Cerrito del Norte to Hodeo	30 minutes	No service	15	35 minutes	20 current stop locations
	Q Saturday service from El Cerrito del Norte to Pinole	30 minutes	30 minutes	31	30 minutes	
Study is in progress to assess the feasibility of Express Bus streamlining in the I-80 corridor.						

PP = Peak period (6:00 a.m.-9:00 a.m., 4:00 p.m.-7:00 p.m.)

MID = Mid-day

EVE = Evening (7:00 p.m. - 12:00 midnight)

SAT = Saturday

SUN = Sunday

TT = Travel times

All times in minutes

In the East Corridor, a lease between the United States Navy and BART for five acres on which the North Concord/Martinez park/ride lot will be constructed will be signed in January 1986. Construction of this project is scheduled to begin in June 1986 with completion slated for November 1986. BART will soon submit a Section 9 UMTA grant application for funds to develop the West Antioch (Somersville Road) park/ride project. Upon funding approval, negotiations will begin regarding land acquisition. Staff is also investigating land ownership and availability of parcels that might be appropriate for the Pittsburg park/ride (Railroad Avenue) project.

In the Central Corridor, local jurisdiction coordination is continuing for the project to construct freeway off-ramp bus stops at Livorna and El Cerro Road along the Interstate-680 Corridor. Meetings have been held with City staff in Danville regarding the El Cerro project. It appears that implementation of this project may be delayed at the request of the City of Danville since the City desires to extend El Cerro Road prior to having BART implement a freeway bus pad express stop.

In the South Corridor, the selection of an environmental consultant to prepare the impact assessment for the Dublin park/ride project is now underway. It is anticipated that this assessment will be completed in June 1986 at which time land acquisition negotiations for the park/ride project would proceed. Negotiations are also continuing with the City of Livermore regarding construction of the West Livermore park/ride project.

In the West corridor, BART is holding a series of coordination meetings with the City of Hercules to decide upon a specific BART station and park/ride site. Resolution of this issue is expected to be clarified prior to the summer of 1986. Although it was BART's intent to implement Interstate-80 express bus streamlining during FY 1986/87, the Western Contra Costa County Transit Authority (WestCAT) has requested that the currently operated level of express bus service be retained until substantial progress can be made on a park/ride project in Hercules to which any streamlined bus routes would have to be anchored.

Progress is continuing to be made toward the development of a single ticket that can be utilized on the BART rail system as well as express bus. This effort will proceed in sequence with implementation of an AC/BART joint ticket.

Interoperator Coordination

BART is the region's primary line-haul transit provider with rail service linking the densely developed regional core and outlying suburban areas. Each community served by the system represents a unique environment in terms of land uses and opportunities for providing effective access to BART stations. Generally, local transit and walk access prevails within the San Francisco/Oakland/Berkeley regional core. And, automobile access gains importance with increased distance from the core within lower density areas. In light of BART's projected ridership and the need to provide cost- and energy-efficient transit access to the system (as an alternative to automobile access and related parking requirements), coordination efforts between BART and other Bay Area transit providers have been intensified in recent years.

BART patrons who do not travel to a station by automobile or by walking must rely upon local transit. Additionally, those patrons who do walk or arrive at a station by automobile may still require local transit services for the final leg of their journey away from a BART station. Thus, the need for the coordination of services and fares is further emphasized along with the need for a support program of public information. This section of BART's 1986 Five Year Plan describes District

activities related to continued and improved inter-operator coordination as called for in the Metropolitan Transportation Commission's 1985 Transit Coordination Evaluation (pursuant to Section 99282.5 of the California Public Utilities Code and MTC Resolution 1070). The discussion is presented in five parts, each corresponding to sections identified in the 1985 MTC TCE Report. These are: fares and transfers, schedules, public information, service connections, and physical facilities.

Figure II-9 on the following page summarizes the 1985 TCE comments and respective BART responses.

Fares and Transfers

The District considers fare coordination with other Bay Area transit operators as part of RTA activities, the 842 process, and the need to provide a balanced District budget. BART's base fare is currently 80¢ for trips under 6 miles in length. Transbay BART fares currently range from \$1.40 to \$3.00.

The importance of minimizing the costs and inconvenience associated with inter-operator transfers to and from BART has long been recognized. This is particularly important with improving regionwide transit access where the services of more than one operator are very often required, as well as for short trips where an origin or destination is not located within a comfortable walking distance of a BART station.

In an effort to reduce these "frictional barriers," BART has sought to implement innovative ways to accommodate patron transfers while also striving to improve its financial performance in terms of farebox recovery. The 2-part transfer which is available at San Francisco and East Bay stations is an outgrowth of this effort. These transfers provide up to a 50% fare reduction on a round-trip basis for patrons leaving and returning to a BART station. Similar arrangements are in effect for BART express bus service, Santa Clara County Transit, and Central Contra Costa Transit. As part of the intensified AC/BART coordination effort initiated in mid-1984, a higher AC-transfer discount is provided during off-peak hours to encourage ridership in this time period when capacity on BART is readily available.

Increased ridership, as part of this latter effort, has not been realized to date. On the contrary, ridership for the restructured AC bus routes has declined and the District is currently in the process of renegotiating its third annual contract with AC Transit in an effort to improve the service and its cost-effectiveness to both operators.

In contrast is the very successful coordination effort for the BART/MUNI joint pass which became available in April 1983. Under the terms of a special revenue sharing agreement, this improvement extends the use of BART service within San Francisco to holders of MUNI's regular adult monthly Fast Pass. This eliminates all patron transfer costs between the two systems while also providing for unlimited rides during any month. Average weekday BART Fast Pass trips have more than doubled since April 1983, from just under 12,000 then to 26,000 as of May 1986. Fast Pass trips have continued to grow in response to fare increases for both BART and MUNI beginning January 1986 relative to a simultaneous Fast Pass price reduction from \$24 to \$23.

TABLE II-9
1985 MTC TCE RECOMMENDATIONS AND BART RESPONSES

MTC:	Place the appendix on an Inter-Operator Coordination as a section in the main body of the SRTP and respond therein to each of the 1985 TCE recommendation which refer specifically to BART. BART: BART concurs with inclusion of these recommendations in the 1986 Five-Year Plan together with BART responses.
MTC:	Work with the connecting operators towards instituting more convenient two-way transfers. BART: BART and AC Transit have identified a joint ticket concept which will eliminate the need for regular riders to use the single transfer tickets. BART and AC Transit are studying other changes should want an evolution of the joint ticket.
MTC:	Document the effects of the purchase of service agreement with AC Transit, including the effect of service revisions, and provide data on rail/bus ridership. Conduct an analysis to determine the patronage impacts of the "reduced fare" and other fare changes and the transfer arrangements with AC Transit. Document these impacts in the SRTP. BART: The purchase of services agreement with AC Transit did not produce cost effective service improvements. Accordingly, BART is planning to shift its basis of support for AC to a transfer payment approach based upon the number of transfers. BART is working with AC Transit to determine the best transfer arrangement for both agencies to pursue improvements to transfer arrangements.
MTC:	Include data on interoperator transfer volumes by station in the Inter-Operator section of next year's FIP. BART: Estimates of interoperator volumes by station have been developed from 1985 Passenger Profile Survey data and have been included in the 1986 FIP.
MTC:	In conjunction with RIA, develop an implementation timetable for improved transit connection displays at RTC's. These transit displays should include the following components: - prominently post uniform large-scale BART train schedules at the concourse level and at the platform level with that particular stations' train schedule highlighted; - post signs showing major destinations served by station inside the paid area of each station and preferably at the platform level as well; - update BART station area maps to include current bus routings; - post each connecting bus operator's system map under glass in a prominent location with schedules and maps included for each line serving the particular station;

(e)	development and prominently post a uniform sign showing a diagram of bus stop locations for each connecting line;
(f)	improve the availability of pocket bus schedules at station agent booths;
(g)	place advertisements for the Regional Transit Guide in each station along with a listing of the closest retail outlet.
BART:	BART works closely with the other transit operators through RIA to review and revise transfer information as necessary. Installation of a Passenger Information Center at 12th Street Station is scheduled for implementation during early FY 86/87, as part of a three-phase program to improve the value of the transit transfer service. Phase I is to be implemented over the next two years and will include all designated regional transfer stations. Based on an evaluation of Phase I and II, expansion of this program to remaining BART stations may be implemented as a third phase.
MTC:	Upgrade and extend the use of the bus signal beacon system to include additional bus operators, particularly at stations which serve as a major focus for local bus routes. BART: Beacons are operational at all express bus transfer stations. The remaining stations on the Concord line are candidates for installation. BART has been studying the system and has some significant problems in practice in that BART has no control over bus drivers who fail to observe the 5-minute wait after the beacon starts flashing, and bunching of trains may keep the beacon on continuously making its signal meaningless.
MTC:	Continue joint efforts with AC Transit to utilize RIGUS for improved schedule information between BART trains and express and local buses. BART: BART will continue efforts with AC Transit to improve transfer schedule coordination.
MTC:	Place teleguides at all RTCs and work towards upgrading the information which they provide. Place teleguides at more prominent locations inside the Powell BART Station Visitor Center at more prominent locations (presently placed furthest away from entrance and hidden by large displays).
BART:	BART is working with the teleguide vendor to upgrade the teleguides to include more information and without capability for information and coupons is now underway.

An expansion of the Fast Pass concept is currently under development. This Superpass is to include AC Transit. BART faregates have already been modified and are capable of processing this new pass which is scheduled to become available for use on both systems starting January 1987 as a 6-month demonstration project.

The Fast Pass concept was extended to the BART express bus system beginning July 1985. Additionally, a 20-coupon book was made available one month later. The advantage of the coupon book is the fact that the tickets are used only when needed. The pass, on the other hand, while offering unlimited riding during any one quarter, has a specified expiration date.

Schedules

Coordination of BART service with connecting BART express bus and local transit operations had to await the availability of a printed train schedule which, for weekday service, did not appear until April 1983. This was predicated on BART's ability to provide reliable weekday train service at the 95% on-time level. Since April 1983, schedule coordination efforts have been intensified. First, BART express bus schedules were revised so that better connections could be provided at rail stations. In conjunction with this was the implementation of a bus light signal system at each express bus rail station for the purpose of alerting bus drivers of the arrival of a train. This has proven to be an effective mechanism for briefly delaying express bus departures so that arriving rail patrons may make an immediate transfer.

The District is continuing to discuss with AC the possibility of extending adherence to the currently installed bus signal system to additional connecting bus routes in the East Bay. Currently, only (AC operated) BART express bus drivers adhere to the signal system. (CCCTA bus drivers also adhere to the signal system at Concord and Walnut Creek Stations.) Depending upon the success of extending this system to include other routes, future plans may include the expansion of the signal system to rail stations other than those now served by BART express buses (Bayfair, Hayward, Walnut Creek, Concord, and El Cerrito del Norte).

District efforts to encourage Bay Area operators to revise routes and schedules have focused on the AC/BART coordination effort which was initiated in mid-1984. Under a special purchase of service agreement, BART provides financial support for selected AC Transit bus routes which, in turn, have been restructured and scheduled to provide improved feeder/distributor service to and from BART stations.

In addition to AC Transit service revisions are those now in process for CCCTA service. The current focus is on coordinating afternoon peak period bus departures with scheduled train arrivals at five Concord-line stations (Orinda, Lafayette, Walnut Creek, Pleasant Hill, and Concord). CCCTA is the lead agency for implementing these scheduled improvements.

Public Information

Information is communicated to BART patrons in various forms including written and graphic material (available as both hand-outs and displays in stations), system signs, map displays, announcements, and media advertising.

Hand-out material is made available to patrons at all stations. Regularly published items, such as bus timetables, "BART & Buses" brochure, "All About BART", and system timetables, are available in racks located at station agents booths. These racks are checked by agents and re-stocked as needed. An updated BART & Buses brochure was printed and made available in June 1985. This identifies regional transfer stations as well as updated local transit routes including SCCR service from Fremont Station. Additionally, this brochure is a comprehensive guide to public transportation which serves BART directly or is located in the vicinity of a station. Included are: a schematic system map with connecting express bus routes, scaled color maps for selected cities with BART routes and stations shown with local transit routes and major points of interest, accompanying tables indicating local transit frequency of service by route, and a BART fare/travel time matrix. (An updated "All About BART, 1986" brochure was made available starting in January 1986 which contains new fare information.) Special information hand-outs, such as those relating to service changes and special promotions, are stocked in racks located on top of entry/exit gates as needed.

Installation of a Passenger Information Center at 12th Street Station is scheduled for implementation during the early part of FY 1986/87, as part of a three-phase program to improve the availability of information for connecting transit service. Phase II is to be implemented over the upcoming two years and will include all designated regional transfer stations. Based on an evaluation of Phase I and II, expansion of this program to remaining BART stations may be implemented as a third phase.

Passenger information includes system signage which is basic to maximizing patron flows through stations. The original system design included uniform signage in accordance with BART specifications. For the most part, this signage system continues to serve its purpose well. BART's Department of Passenger Services maintains records of patron complaints which are received and logged for 85 separate categories (this is in addition to miscellaneous information requests). System signage is one of these categories. Based on the data, it appears that overall patron concerns do not point toward system signage as a problem (out of 4,353 patron complaints reported during the first 10 months this fiscal year, only 11 were related to system signage). For this reason, no major alterations are currently contemplated. Signs have been added above the transfer machines at East Bay stations starting in late Summer 1984 as part of the intensified AC/BART coordination effort. Similar signs in San Francisco stations, however, are not currently programmed.

Service Connections

As the region's primary rail service provider, BART is a line-haul system oriented towards accommodating point-to-point travel. Access to and from surrounding areas is provided by a full range of modes including walking, bicycle, automobile, and local transit (which includes bus, light rail, commuter rail, cable car, and ferry). Of all the transit modes, buses are the most common means of access to BART for the region as a whole. And, while the current BART system provides service within four Bay Area travel corridors (Transbay, I-80/17 Eastbay, SR-24 Central Contra Costa, and the Mission corridor in San Francisco), bus service provides direct connections from BART with routes in other major

travel corridors. BART express bus service is a good example of this connectivity provided by buses. Current BART express bus service operates within the heavily traveled I-580 corridor linking Livermore Valley communities with BART at both Bayfair and Hayward stations; in the I-680 corridor from the Dublin regional transfer point (near the I-580/I-680 intersection) to Walnut Creek Station; in the SR-4 corridor from Concord Station to both Martinez and to Brentwood (via Pittsburg and Antioch); and in the I-80 corridor from El Cerrito del Norte Station to Rodeo.

BART express bus service is currently being streamlined in order to provide faster, freeway oriented service. This is predicated on the ability of local transit operators to take over the local function BART express buses have been providing. Express bus improvements are to be phased in with the programmed freeway park/ride lots which are part of the District's long-range extension planning efforts. Table II-8 beginning on page II-41 summarizes BART express bus service and streamlining plan.

Other coordination efforts relating to providing regional service connections include the BART funded Loma Ranger in San Francisco, Oakland Air-BART to Oakland International Airport, and Humphrey Go-BART to U. C. Berkeley. Through RTA activities and other coordinated planning efforts, regional connections have been established with service to and from BART at designated regional transfer stations. Examples of this include: SCCTD service from Fremont Station to numerous points in the San Jose area, Golden Gate service from downtown San Francisco stations to the North Bay, and SAMTRANS service from Daly City Station to points on the Peninsula. The District will continue to participate in RTA efforts to identify and implement additional service improvements. Table II-10 on the following page summarizes the daily transfers at regionally designated BART stations.

Physical Facilities

An overall facility description and related services for each designated regional transfer BART station is documented in detail in the 1985 MTC TCE beginning on page B-21, and therefore is not repeated here.

The District has implemented numerous projects over the years in an effort to improve passenger amenities both within and adjacent to BART stations. These include: covered walkways, benches, protective over-hangs, wind screens, lighting, bicycle lockers, etc. BART will continue to coordinate efforts with RTA and other Bay Area transit operators for the purpose of identifying and implementing other such projects.

Elderly and Handicapped Accessibility Improvements

BART recognizes the need to continue to improve system access for elderly and handicapped persons. Prior to the start-up of revenue service in September 1972, the system was retrofitted to accommodate special needs of persons in wheelchairs and for other mobility considerations. Numerous system improvements have been

TABLE II-10
AVERAGE DAILY INTER-OPERATOR TRANSFERS*
BART REGIONAL TRANSFER STATIONS

<u>Station</u>	<u>Weekday</u>	<u>Saturday</u>	<u>Sunday</u>
Embarcadero	4,656	2,318	1,680
Montgomery	4,992	1,850	1,335
Powell	5,314	4,262	2,765
Civic Center	3,758	2,583	1,876
Daly City	7,158	1,288	815
Richmond	1,045	575	382
El Cerrito del Norte	1,610	656	130
12th Street	3,263	3,045	1,732
Coliseum/Oakland Airport	2,743	1,003	616
Bayfair	2,120	714	401
Hayward	3,321	1,148	554
Fremont	2,772	806	592
Walnut Creek	1,548	476	176
Concord	3,325	995	307
Total	47,625	21,719	13,361

* Estimate of transfers to and away from stations are based on May 1985 Passenger Profile Survey.

made over the years such as the installation of signs on trains indicating priority seating, electronically controlled doors, additional curb cuts, special ramps, close-in station parking, and restroom modifications. These and other improvements have been implemented primarily as the result of deficiencies which were identified by the BART Task Force on Access for Elderly and Handicapped Persons. This citizens group meets regularly with BART staff to discuss the needs of the elderly and handicapped community with respect to BART access and safety.

Projects to be continued or initiated during FY 1986/87 for the purpose of improving accessibility to BART for elderly and handicapped persons include:

- o Design of systemwide self-operation elevator control improvements. Implementation of these improvements at other stations (during Phase II) will depend upon a continuing evaluation of those at Berkeley and El Cerrito del Norte.
- o Completion of secondary station agent booth elevator controls at Civic Center, Embarcadero, Berkeley, and 19th Street Stations.
- o Seek funds for continuing installation of platform edging.

The Task Force on Access for Elderly and Handicapped Persons will focus on reviewing and evaluating the above projects during the upcoming fiscal year. The Task Force will also update its work program which will identify other desired improvements to enhance E&H accessibility.

Specific capital projects and implementation schedules for system access are summarized in Figure II-12 beginning on page II-62.

PROGRAM AREA OBJECTIVES

Revised operating performance objectives for the current Five Year Plan timeframe are identified in Figure II-8 below.

PROGRAM AREA H: JOINT DEVELOPMENT

BART's Joint Development Program is a commitment to the general concept of the cooperative development of station areas with both the public and private sectors. The key focus of this program is the identification and implementation of development opportunities to be pursued with regard to BART-owned and adjacent properties.

Early efforts, generally between 1980 and 1983, focused on establishing overall program guidelines, assessing systemwide joint development opportunities, and initiating cooperative working relationships with local jurisdictions. Results of these efforts include a ranking of joint development opportunities for all 34 stations, an analysis of the risks and benefits for different courses of action regarding the disposition of BART property and cooperative planning efforts with the cities of Oakland, Concord, Walnut Creek, Pleasant Hill, El Cerrito, and Daly City, and Contra Costa County. In several instances, this latter effort resulted in amendments to respective local jurisdiction General Plans allowing for higher density development of BART station areas, while at the same time recognizing the need for the formulation of design/development guidelines for marketing of station area property.

Figure II-8

SYSTEM ACCESS PERFORMANCE OBJECTIVES

FY 1986/87

1. Provide 2,955 BART-owned parking spaces at existing rail stations and planned future station sites.
2. Seek to acquire land required for surface parking projects on Bond listing projects.
3. Continue to implement schedule coordination between BART and AC Transit.
4. Implement first stage streamlining in the West Corridor.
5. Implement Express Bus/Rail ticket.
6. Implement AC/BART joint ticket.
7. Initiate installation of Phase II of the elevator improvements.
8. Complete evaluation of platform edge project and seek funds for systemwide installation if appropriate.

FY 1987/88 to FY 1990/91

1. Complete parking redesign and surface parking projects.
2. Complete parking facilities at Pleasant Hill.
3. Complete Daly City Intermodal Facility.
4. Complete freeway off-ramp bus stops and the Dublin, West Livermore, West Antioch, Pittsburg and Hercules Park and Ride lots.
5. Implement second stage streamlining in all Express Bus corridors.
6. Complete installation of Phase II of the self-operation elevator control improvements.
7. Complete installation of the platform edge project.

Based on the initial work for this program as well as for related activities for access and extension planning, the District Board of Directors adopted a set of implementation policies in June 1984. The policies emphasize the cooperative development of station areas for the primary purpose of assisting the District in realizing new sources of revenue (i.e.: through long-term ground lease agreements and higher ridership as the result of more intensive use of station area property).

Specifically, BART's Joint Development program seeks to coordinate comprehensive planning and development of existing and future stations. In addition to an expanded revenue base, benefits of this program include the return of real property to local jurisdiction tax rolls, stimulation of the local economy by creating investment opportunities, and encouragement of transit-linked projects as an alternative to dispersed development dependent upon automobile access.

FY 1985/86 OBJECTIVE STATUS

BART's FY 1985/86 objectives for joint development focus on: achieving key planning milestones, negotiating development agreements, implementing a tenant marketing program, and initiating transit center plans.

Consultant selection took place in September 1985 with regard to the market analysis and urban design components for the Richmond Plan. To date, BART and Richmond have been unable to reach agreement on a Joint Planning Agreement.

The District submitted a request for a General Plan Amendment to the City of Fremont during December. This request is part of an effort to secure the City's approval to allow extensive development of District-owned land in Fremont. BART's objective was to secure this approval by the end of the 1985/86 fiscal year. This Amendment was approved in March 1986.

Efforts continued this quarter to reach consensus with the City of Concord regarding development of BART property in Concord. The formal process to secure City approval, originally scheduled to begin in November 1985, has been rescheduled for April 1986 following the March 4, 1986 special ballot election regarding City height limits. The District's objective is to achieve inclusion of BART's development plans in the City of Concord's urban design guidelines this fiscal year. Reference to development of BART property was deleted by the City prior to adopting its current urban design guidelines. The City of Concord has requested BART to submit its development plans in advance of any City action concerning this property.

Progress also continued towards completing joint planning work for the Daly City Specific Plan (in anticipation of its submittal to the City Council for approval). The plan is expected to be finalized by March 1986 with City Council approval anticipated by June 1986 (versus a District objective to submit the Daly City Specific Plan to the City Council for its approval by the end of this fiscal year).

BART is currently negotiating with several developers for the development of a 200-300 room hotel at the Pleasant Hill Station. It is expected that a ground lease will be signed during the summer of 1986.

With regard to implementing a direct marketing effort aimed at large corporate tenants, the special brochure implemented in September 1985 was mailed to prospective corporations during the first week of October (versus a September 1985 objective date for this effort).

No activity to date has occurred with respect to the District's objective to initiate transit center plans by June 1986 (which assumes necessary land acquisition at West Pittsburg, Dublin, and Warm Springs).

Additional highlights for the July-December 1985 period for joint development include a continuation of discussions with the City of Oakland regarding a joint analysis of development potential for MacArthur Station and its immediate vicinity.

FUTURE OUTLOOK

During the second half of FY 1985/86 Joint Development work will focus on the following:

- o Negotiation of an acceptable ground lease for a hotel project at Pleasant Hill;
- o Submission approval of detailed development plans for the Pleasant Hill office site;
- o Submission of an application for rezoning and development agreement for BART's Concord property;
- o Securing of a general plan amendment and rezoning in Fremont;
- o Exploration of future joint development studies at Hayward, MacArthur, El Cerrito, Coliseum/Oakland Airport, and Lafayette;
- o Resolution of outstanding issues in joint planning agreement with Richmond;
- o Negotiation of acceptable special entrance agreements for the 5th and Market (San Francisco Center) Project and the 388 Market Street project.

PLANNED IMPROVEMENTS

Joint Development efforts will continue to focus on completing work already initiated and to achieve the overall intent and objectives of this program area. The three-phased approach which has been developed consisting of pre-development planning followed by site marketing and property disposition, will continue to be used. Planning work will focus on Fremont, MacArthur, Concord, Hayward, and selected other stations. Marketing efforts will focus on Pleasant Hill, Lake Merritt, and Concord stations.

Efforts will focus on providing support to extension planning activities, specifically at Warm Springs, West Pittsburg, and Dublin extension stations. A companion effort will be the monitoring of development trends within extension corridors as well as along existing routes. Additionally, support will be given to the area of expanded station parking.

It is anticipated that negotiations regarding special entrances to Powell Street Station will take place in response to projects currently underway directly above this subway station. Market strategies are to be developed, including ones which address non-station oriented properties.

PROGRAM AREA OBJECTIVES

Updated performance objectives for BART's Joint Development program are identified in Figure II-9 below.

FIGURE II-9

JOINT DEVELOPMENT PERFORMANCE OBJECTIVES

FY 1986/87

1. Complete station area plans at Fremont and Concord.
2. Assuming local government interest and cooperation, initiate station area planning at two of the following stations:

El Cerrito Plaza	Orinda	Union City
El Cerrito del Norte	Lafayette	Hayward
Coliseum/Oakland Airport		
3. Continue "anchor tenant" and master developer marketing efforts focusing on Pleasant Hill, Concord, and Lake Merritt.
4. Assuming favorable market conditions, negotiate an acceptable ground lease agreement at at least one of the above sites.
5. Negotiate an acceptable special entrance agreement for the Fifth and Market project at Powell Street.
6. Seek to develop additional special entrances.

FY 1987/88 to FY 1990/91

1. Continue station area planning efforts in preparation for marketing specific sites for development.
2. Market specific sites as market conditions and local plans permit.

PROGRAM AREA I: EXTENSIONS

The original BART plan included a multi-phased program to provide rail service well beyond areas presently served. The withdrawal of San Mateo and Marin counties prior to the 1962 bond election resulted in voter approval of 71-mile basic system in the current three-county District and indefinitely postponed further development of the rail system. Over the years, the District has continued to coordinate expansion plans with local agencies while investigating the full impacts of extending the system. Extension plans have received intensive public and private review, and they continue to be revised and updated in response to regional growth and changing economic conditions. The District's adopted extension policy is summarized on page II-57.

Figure II-10

ADOPTED BART EXTENSION STAGING¹

WITHIN CURRENT THREE-COUNTY DISTRICT PRIORITY

- I. North Concord/West Pittsburg
Irvington/Mission
Castro Valley/Dublin
San Francisco Airport²
- II. Pittsburg/West Antioch/East Antioch
Pleasanton/West Livermore/East Livermore
San Francisco³
I-80 Corridor (Partial)
- III. San Francisco³
I-80 Corridor (Partial)
San Ramon Corridor

OUTSIDE CURRENT DISTRICT (Subject to a satisfactory cost-sharing arrangement)

- I. Serramonte/Tanforan
- II. Millbrae
- III. Burlingame/Menlo Park/Palo Alto/San Jose

1. The several segments shown under each Roman numeral are understood to be implemented concurrently.
2. In accordance with Resolution No. 3095 adopted by the District Board of Directors on February 1, 1984, BART supports the establishment of a people-mover, or some other mode of travel, to the Oakland Airport before or at the same time that an extension of BART is built to San Francisco Airport.
3. San Francisco has a BART commitment for a northwest corridor extension or an equivalent project.

As an interim measure until extensions can be constructed, BART provides express bus service between key transfer stations and regional travel corridors in the District not presently served by rail as described under System Access (see pages II-41 through II-44).

Past study has identified BART extensions to serve regional transit needs in four travel corridors located in the current three-county District: Pittsburg-Antioch, Warm Springs (Fremont), Livermore-Pleasanton, and the West Contra Costa I-80 corridor. In addition to these corridors, BART has also been investigated as a potential regional transit improvement in the Bayshore (US-101) corridor in San Mateo and Santa Clara Counties and in the Nimitz Freeway (I-880) corridor in Santa Clara County. These latter two extensions, however, involve resolving the issues of extending BART outside the three-county District priority.

FY 1985/86 OBJECTIVE STATUS

The District has four objectives for extension service and capacity this fiscal year. These focus on: land parcel acquisition, grant sources and applications, local community coordination, and the alternatives analysis/draft environmental impact requirements.

In the area of land parcel acquisition, three parcels were acquired by BART during the July-December 1985 period. Two of these parcels are for the Irvington Station as part of the Warm Springs extension. The third parcel acquired is for the track alignment for this same extension. As of December 1985, this brings the total number of parcels acquired to 12, or 44% of the 27 required for the priority I portion of BART's Extension Right-of-Way and Facilities Program (for additional details, see Table II-11 on page II-59).

With regard to grant sources and applications, the District submitted an application to Caltrans in October for the funding of BART's Priority I Extension Right-of-Way and Facilities Program.

Efforts continued to coordinate extension plans with local community public and private interests. The ongoing Livermore-Pleasanton Extension Study Supplemental Analysis is reviewing potential alternative alignments between the District adopted Dublin Station location and the proposed East Livermore Station and Storage Yard. A community meeting was conducted in August to receive public input concerning possible Livermore Valley alignments. An interim report was completed in October and made available to public agencies and local community groups for review and comment. This report contains a description of the conceptual design features of the most recently identified route alternatives for this extension. Activities are also coordinated with the Fremont-South Bay Policy Advisory Committee and Technical Advisory Committee with respect to the Warm Springs extension. The District has had contact with and has advised developers of current plans for extending the system to Warm Springs.

Coordination with transportation planning in the West Bay focused on the formation of a Joint Powers Agreement with representatives from the State, transit districts in San Mateo and Santa Clara counties, the City of San Francisco, and BART. This was a key recommendation of the Peninsula Mass Transit Study which was completed in July 1985. Additionally, the November 5, 1985 election in San Mateo County on a Serramonte/Colma Station resulted in 73% voter approval for use of San Mateo County funds for this one-station extension.

Table II-11

ACQUISITION STATUS FOR PHASE/PRIORITY I

EXTENSION LAND REQUIREMENTS

(As of December 31, 1985)

<u>STATION SITE OR ALIGNMENT</u>	<u>EXTENSION CORRIDOR</u>	<u>TOTAL REQUIRED</u>	<u>NOT YET ACQUIRED</u>	<u>ALREADY ACQUIRED</u>	<u>UNMILLING SELLER</u>
East Antioch Station	Pittsburg-Antioch	5	0	4	1
West Pittsburg Station	Pittsburg-Antioch	2	0	2	0
North Concord Station	Pittsburg-Antioch	1	1*	0	0
Castro Valley Station	Livermore-Pleasanton	2	0	2	0
Dublin Station	Livermore-Pleasanton	6	3	0	3
Irvington Station	Warm Springs	7	3	3	1
Warm Springs Station	Warm Springs	1	1	0	0
Track Alignment, Irvington	Warm Springs	3	1	1	1
GRAND TOTAL		27	9	12	6

* Lease with Navy signed by BART and Navy in January 1986.

Efforts also continued towards achieving the District's extension objective which calls for the initiation of the alternatives analysis/draft environmental impact requirements for BART's Phase I extension staging policy. During the July-December 1985 period, the following workscopes were submitted to the Urban Mass Transportation Administration for its review and approval:

- o The Pittsburg-Antioch Corridor Alternatives Analysis/Environmental Impact Study/Environmental Impact Report.
- o The Fremont-South Bay Corridor Alternatives Analysis/Environmental Impact Study/Environmental Impact Report (this was formally submitted by the Metropolitan Transportation Commission and includes a Warm Springs BART extension).

FUTURE OUTLOOK

Extension planning activities for the remainder of the 1985/86 fiscal year are expected to focus on the initiation of the Alternatives Analysis/Draft Environmental Impact Requirements for Phase I of the Extension Staging Policy. Efforts will continue in negotiating the acquisition of extension sites as identified in the Extension Right-of-Way and Facilities Expenditures program. BART will also continue to work with local communities, developers, and property owners to maximize coordination during the development process. Additionally, BART will pursue completion of the Livermore-Pleasanton Extension alignment evaluation between Dublin and Livermore.

PLANNED IMPROVEMENTS

Extension planning efforts within the current Five Year Plan timeframe will focus on completing the Alternatives Analysis/Final Environmental Impact Requirements for Phase I of the BART Extension Staging Policy. Concurrent efforts will focus on extension rights-of-way through continued implementation of the Extension Right-of-Way Acquisition Program. An additional task will determine the location of four West Contra Costa County extension stations.

PROGRAM AREA OBJECTIVES

The performance objectives for this program area are identified in Figure II-11 below:

FIGURE II-11

EXTENSIONS PERFORMANCE OBJECTIVES

FY 1986/87

1. Assist the Metropolitan Transportation Commission and SCCTD in completing the Preliminary Draft Alternatives Analysis/Draft Environmental Impact Document for the Fremont-South Bay Corridor by June 30, 1987.
2. Pursue acquisition of all sites as identified in the Extension Right-of-Way and Facilities Expenditures program within available funding by June 30, 1987.
3. Complete the Preliminary Draft Alternatives Analysis/Draft Environmental Impact Document for the Pittsburg-Antioch Corridor by June 30, 1987.

FY 1987/88 to FY 1990/91

1. Continue to implement the Extension Right-of-Way Acquisition Program.
2. Complete the Alternatives Analysis and Final Environmental Impact Requirements for Phase I of the BART Extension Staging Policy.

FIGURE II- 12
1986 FIVE-YEAR PLAN
CAPITAL PROJECT LIST

PROJECTS WITH SCHEDULED COMPLETIONS

FMS #	PROJECT NAME	COMPL DATE
27EB	REPL FIELD COMPUTERS-DAS (PFI)	04-86
91FD	UNDRGRD VENT STUDY-SYSTEMWD	06-86
07C-	KE TRACK (KET)	02-86
41BG	BRAKE GRID HEAT SHIELDS	09-86
41EI	VEHICLE FIRE HARDENING	09-86
15AY	FAN CONTROL SAFETY ENCLOSURES	02-86
17FD	BLDG MODS-STREET/ELEC/MECH-STB	01-87
17BR	1985 BPS OFF. & SPACE MODS-LMA	03-87
61--	INTEGRATED CONTROL SYSTEM -ICS	10-87
79AC	NEW VANS FY 86/87	09-87
79B-	REPL COVERAGE SED/MNT VEH (84/6)	09-87
27CB6	RADCCM	10-87
03PJ	AD'L ATC WORK SPACE @ TC RM-COY	01-87
05NJ	AD'L ATC WORK SPACE @ TC RM-RIY	01-87
20AD	E-O-LINE MAKES & BREAKS	01-87
01XG	PERM IMPS/CALTRANS LOT-FMS(I)	02-87
09FE	RPLC PCB TRANSFORMER @ SF VENT	11-87
42--	2ND GEN TRANSIT VEHICLES/ATC	05-87
42AA6	150 2ND GEN TRANS VEH W/PRQ ATC	09-88
11--	DALY CITY TURNBACK & YARD PRGJ	06-88
11CH	M87 INTERLOCKING	07-88
41GB	2ND GENERATION ATO/136 A-CARS	11-88
15AZ	WET STANDPIPE & FD CCNNS-21 STA	05-88
45BF	IBM TICKET TRANSPORT RETROFIT	03-89
0--KG	PARKING CAPACITY EXPANSION	11-89
15LC6	ESCALATOR REHABILITATION PRGJ.	02-90
20--	WAYSIDE TC & SYSTEM PERFOR MODS	06-90
0-B-E	EXTENSIONS R.O.W. ACQUISITION	06-97

FIGURE II-12 (Continued)
1986 FIVE-YEAR PLAN
CAPITAL PROJECT LIST

PROJECTS WITH SCHEDULED COMPLETIONS

FMS #	PROJECT NAME	COMPL DATE
45CB	8 TH RETROFIT - CUBIC AFC	08-86
17CG	PRKG LOT PAVING, STORG AREA-OSA	10-86
03CI	TEST 34.5 KV SUBTRANSM LINE-CLN	04-86
11II	RESTROOM ACCESS MODS - CCS	03-86
15CL	RAIL REPL PH V (86/7)	06-86
45AC	EXPAND AFC DAS CAPABILITY	06-86
03FD	FIRE MAIN MODIFICATIONS(BHT)	07-86
79MC	RAIL TRANSPORT BUGGIES	08-86
15BF	STATION PIGEON CONTROL	09-86
79AD	NEW PICKUPS FY 85/86	09-86
03FK	2ND PWR TRANSFORMER/E.PORTL-EHT	10-86
79B-	REPL OVERAGE SED/MNT VEH (82/4)	12-86
79ME	TRACK GEOMETRIC ANALYSIS CAR	12-86
03CH	34.5 KV SUBTRANSM LINE MODS-CLN	06-86
27BB	COMMUNICATNS CABLE NETWORK-CCN	10-86
27RB	PLATFORM CCTV-DOWNTOWN STAS	12-86
91FC	EMERG VENTILATION-OAK WYE(KWY)	01-86
04GA	200-SP BAILEY RD PK/RD LOT-ANS	05-86
11IG	REPLACE SECURITY DOORS-CC STA	03-86
44DC	REPLACE AFC EQUIP. COMPONENTS	04-86
11FH	STA VENTILATN FAN CONTRL MODS	05-86
79--	REPL MAINT EQ (82/4)	10-86
27QB	PLATFORM PA EXT ABOVE GRD STAS	11-86
41JG	NEW DBL POSITIV PLATE BATTERIES	03-86
64BD	MIS COMPUTER UPGRADE-TRDWC&SFTW	01-86

FIGURE II-12 (continued)
1986 FIVE-YEAR PLAN
CAPITAL PROJECT LIST

PROJECTS WITH COMPLETION DATES ONCE FUNDED

FMS #	PROJECT NAME	CCMPL DATE
01QF	836- SP PKG EXPAN/PH II-SHS(XR)	18MCS
01RM	EXPAND TRANSPORTATION BLDG-HAY	20MCS
03LG	FRINGE PKG FACILITY -WCS (I)	44MOS
03PH	EXPAND TRANSPORTATION BLDG-CCY	20MCS
04DA	BUS STATN PARKRIDE LOT-NCM(XR)	11MCS
05NF	EXPAND TRANSPORTATION BLDG-RIY	20MCS
06KA	200-SP PRKRD LOT/PH I -HRS(XR)	11MCS
06KB	300-SP PRKRD LOT/PH II-HRS(XR)	04MCS
08KA	BUS TRANSFR/PRKRIDE LOT-WLV(XR)	15MOS
10AJ	1680 XPRS-BUS CN-RAMP PADS-SLRN	20MCS
11FG	2 END STAIRWAYS-PLATF/MEZZ-EMS	19MCS
15CM	2ND RAIL REPL PROG (I) FY 87/88	16MOS
15EG	ELECTRICAL CAPACITY IMPROVEMENT	41MCS
15EX	PG&E RATE EVALUATN/ALT SOURCES	06MOS
15NG	SELF OPERATOR-ELEVATORS/HNDICPD	15MOS
20HD	ADD'L STATION ESSENTIAL POWER	14MCS
79--	REPL MAINT EQ (84/6)	31MCS
79AC	NEW VANS FY 87/88	6 MCS
79AD	NEW PICKUPS FY 87/88	6 MCS
79DA	NEW HI-RAILERS - GEN FY 87/88	12MOS
79DA	NEW HI-RAILERS - GEN FY 86/87	18MOS
79IV	VACUUMS & SCRUBBERS FY 85/86	9 MCS
XXXX	DALY CITY INTERMODAL FACILITY	42MOS
XXXX	PLEASANT HILL STA JOINT DEV PJS	03MCS

FIGURE II-12 (Continued)
1986 FIVE-YEAR PLAN
CAPITAL PROJECT LIST

PROJECTS WITHOUT COMPLETION SCHEDULE

FMS #	PROJECT NAME	COMPL DATE
0---E	BART SYSTEM EXTENSIONS	TBD
01EE	435-SP PRK FAC-LMS	TBD
01GG	ALAMEDA PARKRIDE LOT FVS	TBD
01MG	200-SP SOUTH PKG EXPAN-BFS(IV)	TBD
01VG	500-SPACE SATELLITE LOT-UCS(II)	TBD
02AC	FREMONT-S. BAY STUDY & AA/EIS	TBD
03JE	PERM IMPVT/CALTRANS LOT-LAS (I)	TBD
03NE	1200-SP. WEST LOT EXPANS-PHS(I)	TBD
03NG	1600-SP. REPLACEMENT PKG-PHS(I)	TBD
04AC	EIR & PREL ENGRG/P-LINE PH I	TBD
05MD	COMPLETE WEST END OF LOT (RIS)	TBD
08GA	1400-SP PK/RD LOT W/BRIDGE-CUE	TBD
11ED	100-SPACE PARKNG EXPAN-OWS(II)	TBD
11TD	SHOP FACILITIES - QDY	TBD
15AKE	EMPLOYEE BREAKROOMS AT STATIONS	TBD
15N-	PH IV SYSTEM ACCESSIBILITY IMPS	TBD
20AE	NON E-O-LINE MAKES & EREKS	TBD
21EEE	ACI SYSTEM IMPV - YARDS (PH II)	TBD
79--	REPL MAINT EQ (86/8)	TBD
79--	REPL MAINT EQ (88/90)	TBD
79B-	REPL OVERAGE SED/MNT VEH(86/8)	TBD
79B-	REPL OVERAGE SED/MNT VEH(88/9)	TBD
98DD	REGIONAL EMERGENCY TRAINING PROGRAM	TBD
XXXX	AERIAL BARRIERS- PH I&II	TBD
XXXX	SYSTEM SAFETY UPGRADE-PH III IREM	TBD
XXXX	COURTESY PHONE BACKUP ANS CAPAB	TBD



CHAPTER III

FIVE YEAR FINANCIAL PLAN



Given the foregoing identification of specific performance objectives for the five-year period, it is the purpose of this chapter to identify the financial requirements for implementing proposed improvements and service expansion, to highlight problems limiting implementation, and to recommend feasible solutions in the form of a five-year financial plan. This chapter is comprised of two sections, focusing first on the operating budget projections and then on capital budget projections. Underlying assumptions are presented within each of these sections. Summary financial projections are then shown in tabular form. Problems resulting from the projections are highlighted and proposed solutions discussed.

FIVE-YEAR OPERATING BUDGET PROJECTIONS

The District's five-year operating budget projections are based on the preliminary FY 1986/87 budget. The District's five-year operating budget projections appear in Table III-1.

FY 1986/87 OPERATING BUDGET

The preliminary operating budget for FY 1986/87 has been developed to meet the previously described goals and objectives. Year-to-year comparisons below are in terms of the adopted FY 85/86 budget. However, because operating revenues and financial assistance are significantly below budgeted FY 85/86 levels, estimated/actual FY 85/86 figures are also shown.

The budget anticipates net fare revenues of \$84.2 million with a rail farebox ratio of 52.3%, and other operating revenues of \$7.8 million, resulting in an operating ratio of 52.8%.

Property Tax receipts are estimated at \$6.75 million, and Sales Tax receipts are forecast at \$88.9 million.

Operating Expenses are anticipated to increase by \$10.6 million (6.4%) over the FY 1985/86 budget to \$174.5 million for the year.

Net labor cost is expected to increase \$5.9 million (5.5%). Labor cost is based primarily on contractual wage and salary increases, plus the increased cost of providing existing fringe benefits. Approximately \$0.6 million of this increase is due to the planned expansion of peak and offpeak service as noted above.

Total nonlabor cost is expected to increase by \$4.7 million (5.9%), as follows. The cost of the Express Bus and Shuttle Program is expected to increase by \$0.3 million. New initiatives to make this program more financially effective are expected to continue during FY 1986/87. The purchase of feeder service from AC Transit is expected to cost \$5.775 million. In accordance with the regional transit financial planning agreement among BART, the two other major transit operators and MTC, feeder service will also be purchased from S. F. MUNI for \$1.3 million.

Traction/Station Power cost is expected to be \$0.8 million higher than the cost budgeted for FY 1985/86. Of the projected increase, about \$0.5 million is for additional peak and offpeak service. Other nonlabor expense is expected to increase by \$1.9 million of which \$0.1 million is associated with new service.

TABLE III-1
1986 FIVE-YEAR OPERATING BUDGET FINANCIAL PROJECTIONS
ASSUMES 15% FARE INCREASE JANUARY 1, 1989
(\$ 000)

	Actual 1984/85	Budgeted 1985/86	Estimated Actual 1985/86	Projected 1986/87	Projected 1987/88	Projected 1988/89	Projected 1989/90	Projected 1990/91
1 Net Rail Revenue: Normal Growth/Offpeak Marketing	\$66,441	\$77,308	\$72,425	\$82,159	\$84,314	\$92,144	\$98,272	\$100,914
2 Net Rail Revenue: New Peak Load Point Demand	0	0	0	951	1,877	3,228	6,611	8,638
3 Express Bus Revenue	1,027	1,320	928	1,099	1,453	1,970	2,060	2,122
4 Net Passenger Revenue	\$67,468	\$78,628	\$73,353	\$84,210	\$87,644	\$97,342	\$106,942	\$111,674
5 Interest Earnings	\$ 5,453	\$ 6,243	\$ 5,123	\$ 6,240	\$ 5,500	\$ 4,800	\$ 4,500	\$ 4,000
6 Fiber Optics Joint Venture Income	0	80	79	81	137	230	240	250
7 Other (Advertising, Concessions, Etc.) Revenue	1,395	1,739	3,893	1,510	1,670	1,758	1,847	1,936
8 Other Operating Revenue	\$ 6,848	\$8,062	\$ 9,095	\$ 7,831	\$ 7,307	\$ 6,788	\$ 6,587	\$ 6,186
9 Net Operating Revenues	\$74,316	\$86,690	\$82,448	\$92,040	\$94,951	\$104,130	\$113,529	\$117,860
EXPENSES								
10 Net Labor - Current Service (85/86 Base + Additional Base)	\$100,617	\$107,935	\$106,971	\$113,276	\$118,236	\$126,146	\$133,178	\$140,751
11 Net Labor - New Peak Direction Service	0	0	0	2,660	4,660	8,492	8,494	9,029
12 Net Labor - Additional Offpeak Car Mile Expense	0	0	0	224	414	422	744	875
13 Electric Power - Current Service	17,936	21,261	19,175	21,575	25,071	26,951	28,973	31,146
14 Electric Power - New Peak Direction Service	0	0	0	130	1,016	2,433	5,068	5,738
15 Electric Power - Additional Offpeak Car Mile Expense	0	0	0	395	681	761	883	1,112
16 Purchased Transportation - Express Bus	6,708	7,727	7,559	8,099	8,504	8,929	9,376	9,844
17 Purchased Transportation - BART Shuttles	150	256	214	226	238	249	262	275
18 Purchased Transportation - Feeder Service	3,065	5,500	5,500	7,083	7,437	7,809	8,199	8,609
19 Other Nonlabor - Current Service	18,668	21,217	21,851	23,003	23,947	25,064	26,292	27,607
20 Other Nonlabor - New Peak Direction Service	0	0	0	10	165	551	1,163	1,297
21 Other Nonlabor - Marketing & Extra Offpeak Car Mile Expense	0	0	0	75	269	295	396	460
22 Total Operating Expenses	\$147,144	\$163,896	\$161,270	\$174,457	\$188,842	\$204,631	\$223,028	\$236,743
23 OPERATING DEFICIT	(72,828)	(77,206)	(78,822)	(82,416)	(93,891)	(100,501)	(109,499)	(118,883)
FINANCIAL ASSISTANCE								
24 Property Tax Revenues	\$5,734	\$ 6,437	\$ 6,437	\$ 6,750	\$ 7,155	\$ 7,584	\$ 8,039	\$ 8,522
25 Sales Tax Revenues (BART 75% Share)	81,055	86,120	84,232	88,856	94,187	99,839	105,829	112,179
26 TDA ("BART Only")	0	564	564	548	398	422	447	474
27 STA, Other State Funds	3,646	1,941	1,826	2,399	2,421	2,566	2,720	2,883
28 Debt Service Allocations	(8,222)	(9,542)	(12,439)	(13,800)	(13,800)	(15,700)	(15,700)	(15,850)
29 Capital and Other Allocations	(10,301)	(8,315)	(1,808)	(4,505)	(4,594)	(4,730)	(4,906)	(5,087)
30 Total Financial Assistance	\$72,412	\$77,205	\$78,812	\$80,247	\$85,767	\$89,980	\$96,379	\$103,121
31 NET FINANCIAL RESULT	(416)	(1)	(10)	(2,169)	(8,124)	(10,521)	(13,120)	(15,762)
NET OPERATING RESERVE								
32 Beginning Balance	\$ 5,744	\$ 5,328	\$ 5,328	\$ 5,327	\$ 5,929	\$ 5,195	\$ 5,195	\$ -28,835
33 Ending Balance	\$ 5,328	\$ 5,327	\$ 5,318	\$ 5,929	\$ 5,195	\$ -28,835	\$ -28,835	\$ -44,587

* Must equal or exceed \$5.0 million including allowance for 2% Sales Tax Revenue Bond operating reserve.

CONTINUATION OF TABLE III-1:
FIVE-YEAR OPERATING BUDGET PROJECTIONS

FINANCIAL INDICATORS

	Actual 1984/85	Budgeted 1985/86	Estimated Actual 1985/86	Projected 1986/87	Projected 1987/88	Projected 1988/89	Projected 1989/90	Projected 1990/91
34 Annual Patronage	60,798	61,846	59,276	60,423	62,616	63,797	66,248	69,191
35 Annual Passenger Miles	789,292	801,166	758,994	774,616	802,737	817,878	849,299	887,029
36 Fare Box Ratio: Rail, Normal Growth/Offpeak Marketing	48.4%	51.4%	48.9%	51.8%	50.0%	51.2%	51.6%	50.0%
37 Fare Box Ratio: Rail, New Peak Load Point Demand		0.0%	0.0%	190.4%	45.3%	41.4%	44.9%	53.8%
38 Fare Box Ratio: Rail, Total, Rail Only	48.4%	51.4%	48.9%	52.3%	49.9%	50.8%	51.1%	50.3%
39 Fare Box Ratio: Express Bus Service	15.3%	17.1%	12.3%	13.6%	17.1%	22.1%	22.0%	21.6%
40 Operating Ratio	50.5%	52.9%	51.1%	52.8%	50.3%	50.9%	50.9%	49.8%
41 Rail Cost Per Passenger Mile	\$0.174	\$0.188	\$0.195	\$0.205	\$0.215	\$0.229	\$0.242	\$0.246

CAPITAL & DEBT SERVICE ALLOCATIONS

42 Revenue Bond Debt Service: 1982/1985 Sales Tax Revenue Bonds	\$ 6,826	\$ 8,342	\$11,239	\$12,600	\$12,600	\$14,500	\$14,550	\$14,650
43 Sales Tax Anticipation Note Debt Service	1,396	1,200	1,200	1,200	1,200	1,200	1,200	1,200
44 Improvement Allowance	2,900	3,000	709	3,100	3,200	3,300	3,400	3,500
45 Planning	401	580	580	668	697	744	785	830
46 Joint Development	0	519	519	737	697	687	721	757
47 Supplemental/Other Capital Allocation	3,000	4,216	0	0	0	0	0	0
48 Extension ROW Acquisition	2,000	0	0	0	0	0	0	0
49 Parking Facility Construction	2,000	0	0	0	0	0	0	0
50 Total Capital & Debt Service Allocations	(18,523)	(17,857)	(14,247)	(18,305)	(18,394)	(20,430)	(20,656)	(20,937)

Expected receipts of financial assistance through MTC, of \$2.4 million SB 1335 (STA) and \$0.5 million TDA funds are budgeted.

As called for in last year's Five Year Plan, certain capital expenditures are also to be funded from operating sources. Capital Allocations totalling \$4.5 million are budgeted for Improvement Allowance (\$3.1 million) and Planning and Station Area Development (\$1.4 million). The Operating Budget will also fund Debt Service Allocations of \$12.6 million for the Revenue Bond Debt Service and \$1.2 million for Tax Revenue Anticipation Notes. After these allocations have been budgeted, total operating uses exceed sources by \$2.2 million.

ANTICIPATED GROWTH RATES

This section describes the assumptions on which the updated five-year financial plan is based.

Labor is the most significant element of operating costs at 64.6% with all non-labor costs comprising only 35.4% over the next 5-year period. The operating budget plan in Table III-1 identifies two components of labor expense, the current base and that which is required for expanded service. The base includes those positions which are needed to maintain current service. Over the five-year period, some new positions will have to be added for this purpose. However, most of the increase in the base reflects the cost of anticipated improvements in wages and benefits as covered by new contracts which are to be negotiated during this five-year cycle. Maintaining current employee benefits over the five-year period and providing the additional positions needed to continue existing service are also included. The increased cost of these three factors is expected to range from 4.1% to 6.7% annually.

Non-labor expense includes two major items, electric power and purchased transportation (express bus, shuttle and feeder service), and a variety of other lesser items.

The forecasting of future power cost increases is subject to a considerable degree of uncertainty given the large number of influencing factors. These include decisions made at the State and Federal levels concerning atomic power plant certification and international political developments which affect the price and/or availability of oil. Another significant factor is the magnitude of rainfall and thus available hydroelectric resources. The power cost associated with providing the projected level of service (30,109,000 annual vehicle miles) is expected to increase 1.5% the first year, 16.2% the second year, and 7.5% annually thereafter. Higher than normal rainfall this year and falling fuel prices may significantly reduce the future power cost increases anticipated at this time. These factors need to be carefully reassessed and adjusted if warranted. This review will be carried out early in the FY 86/87 budget period after a decision regarding future energy costs has been rendered by the CPUC.

It is anticipated that the Express Bus program will be streamlined during the coming five-year period to improve its financial effectiveness. At this point, it is not clear what the financial impact will be of improved operating performance.

The incremental power cost of planned service expansion is shown in Table III-1. All other nonlabor expense items are expected to increase by an average of 5.0% annually.

BART passenger revenue growth was documented above in Table I-6 (see Chapter I). These estimates reflect the impact of the 30% increase in fares implemented in January 1986 and an assumed 15% increase beginning January 1989. Other operating revenue is expected to be somewhat lower in FY 1986/87 than budgeted in FY 85/86 because of declining interest rates on investment of operating funds and revised advertising revenue expectations.

For the upcoming five-year period, BART sources of financial assistance are forecast to grow at somewhat lower rates than last year's plan assumed. This forecast now anticipates that economic growth will be more moderate than that experienced over the past 12-18 months. Property tax revenues are expected to increase by 6.0% annually. Sales tax yields are likewise projected to expand by 6.0% per year, based on the projected statewide growth of 6.8% forecast by the Commission on State Finance, as adjusted to the historically lower growth rate for the three BART counties.

Discretionary financial assistance which is allocated to BART by MTC is likewise projected at significantly different levels in this year's Five Year Plan, based on the preliminary allocation estimate furnished earlier this year. This estimate calls for only \$2.4 million of STA funds and \$0.5 million of TDA funds. For purposes of the current financial plan, STA and TDA funds are expected to grow at the rate indicated above for BART sales tax revenues. STA projections are based on FY 1986/87 current year allocations only. However, this assumption may have to be revised after the State budget is established. At this time, there is some uncertainty regarding the level of STA funding to be approved.

ADDITIONAL STAFFING REQUIREMENTS

In preparation for the planned increases in service capacity, BART will need to begin expanding its current staffing level to support this change. Most of the increase will occur in the operations departments as the District takes delivery of new revenue vehicles, expands to provide appropriate maintenance, and ultimately puts more cars and trains on line. A few additional positions will be required in administrative and support departments, due to the increased workload produced by increased cash handling volume and new marketing programs.

Table III-2 summarizes new hiring requirements for the five-year period as projected by appropriate departments. The largest increases are in Field Services, Power & Way Maintenance, Finance and Rolling Stock Maintenance. As expected, staffing increases in these departments will be required in anticipation of receipt of the new revenue vehicles and with sufficient lead time for training prior to inauguration of expanded peak period train service.

Table III- 2

PROJECTED REQUIREMENTS FOR ADDITIONAL STAFF POSITIONS
 FY 1985/86 - FY 1990/91
 (As of June 30th)

DEPARTMENT	BUDGET 85/86*	INCREMENTAL POSITIONS					SUBTOTAL 5-YEARS	TOTAL 90/91
		86/87*	87/88	88/89	89/90	90/91		
General Manager	5							5
Legal	17	1					1	18
Finance	110	6	3	12	2	2	25	135
District Secretary	4							4
Planning & Analysis	33	1					1	34
Public Affairs	12		1	1			2	14
Safety	14							14
Employee Relations	70	(8)					(8)	62
Affirmative Action	8							8
Budget & Capital Program Control	15							15
Materials Management & Procurement	70	1	2		9		12	82
Information Systems	34	2					2	36
Administrative Services	36	2					2	38
TOTAL ADMINISTRATION & SUPPORT SERVICES	428	5	6	13	11	2	37	465
Maintenance & Engineering	1202	16	31	17	13		77	1279
Admin. & Maintenance Support	131				1		1	132
Communications & Component Repair	164		8	4			12	176
Rolling Stock Maintenance	323	10	0	0	9		19	342
Power & Way Maintenance	488		23	13	3		39	527
Engineering & Construction	96	6					6	102
Field Services	702.5	11	17	22	25	3	78	780.5
Admin & Support & Analysis	24							24
Train Operations	304	8	4.5	12	18		42.5	346.5
Station Operations	207.5	3	4.5	3		3	13.5	221
Police Services	167		8	7	7		22	189
TOTAL OPERATIONS DEPARTMENTS	1904.5	27	48	39	38	3	151	2055.5
TOTAL DISTRICT	2332.5	32	54	52	49	5	192	2524.5
CUMULATIVE INCREASE	--	32	94	146	195	200	192	--

Includes part-time train operators and station agents (one-half position each); does not include part-time EPA's and Cadets.

* Includes positions which are capitalized or otherwise reimbursable.

FIVE-YEAR OPERATING BUDGET PLAN

The five-year operating budget plan is summarized in Table III-1. Actual results for FY 1984/85 and estimated results for FY 85/86 are also shown. Note that financial performance in FY 85/86 is significantly below budget in operating revenue and financial assistance. As a result, capital allocations will have to be reduced.

Given the FY 1985/86 financial results, the projected operating deficits for the period FY 1986/87 through FY 1990/91 are cause for concern. In view of the slower than previously estimated growth of operating revenues and financial assistance, future cost containment will take on even greater importance than it has to date. The costing rates reflected in these projections are moderate and realistic with the possible exception of the projected rates of increase in power cost. The power cost estimates need to be reexamined and some savings should be attainable.

According to the projections in Table III-1, annual deficits ranging from \$8-16 million are anticipated in the second through fifth year of the planning period. Note that these estimates include the proceeds of an assumed 15% fare increase in the middle of the third year. Readjustment of power cost projections is expected to improve the net financial result somewhat. However, if actual ridership growth and increases in financial assistance do not exceed current projections significantly, there will be a pressing need for revision of the five-year financial plan.

In order for BART to balance its five-year operating budget, some combination of the following strategies may be necessary:

- (1) Reduction of operating expenses through greater efficiency of operation, including reductions in support programs.
- (2) Reduction of the amount allocated from BART operating funds for capital purposes.
- (3) Deferral of planned service expansion.
- (4) Allocation to BART of some portion of the 25% of the 1/2% sales tax revenues administered by MTC if additional local revenues become available to AC Transit and S. F. Muni.
- (5) Reduction or elimination of the feeder service purchase requirement if additional local operating support becomes available for AC Transit and S. F. Muni.
- (6) An increase in fares greater than the 15% currently assumed to take effect January 1, 1989.

In this presentation, an estimated year-end result is shown for each year. Line 33 represents the District's ending balance in its net operating reserve, or working capital. District financial operations require a working capital balance of \$5 million. The revenue bond covenant requires that a reserve be maintained equivalent to 2% of the following year operating budget. As noted, this will be funded from capital reserves as necessary.

The plan assumes that the revenue bond debt service requirements will be funded each year by an allocation from the operating budget. This and other debt service requirements are summarized in Table III-3.

Table 111-3

FIVE-YEAR PLAN DEBT SERVICE SUMMARY

	FY 85/86	FY 86/87	FY 87/88	FY 88/89	FY 89/90	Estimated FY 90/91
(\$1,000's)						
<u>Debt Service Expense</u>						
General Obligation Bond Interest Redemption	53,840	54,218	54,737	55,311	55,443	47,189
SSD #1 Bond Interest and Redemption	734	735	736	736	735	733
Revenue Bond Debt Service	8,342	12,600	12,600	14,500	14,550	14,650
Sales Tax Anticipation Note Debt Service	1,200	1,200	1,200	1,200	1,200	1,200
Total Debt Service Requirements	\$64,116	\$68,753	\$69,273	\$71,747	\$71,928	\$63,772
<u>Sources of Funds</u>						
General Obligation Bond Interest and Redemption Fund	53,840	54,218	54,737	55,311	55,443	47,189
SSD #1 Bond Interest and Redemption Fund	734	735	736	736	735	733
Allocation from Operating Budget for Revenue Bond Debt Service	8,342	12,600	12,600	14,500	14,550	14,650
Allocation from Operating Budget for Sales Tax Anticipation Note Debt Service	1,200	1,200	1,200	1,200	1,200	1,200
Total Sources of Funds	\$64,116	\$68,753	\$69,273	\$71,747	\$71,928	\$63,772

FIVE-YEAR CAPITAL BUDGET PROJECTIONS

The five-year capital program is the primary means for achieving expanded BART capacity and service level objectives. The capital program is financed from a variety of federal, state, and local grant sources, as well as from the BART operating budget and reserves. The following sections describe the financial requirements for the BART capital program.

The major events affecting this year's capital portion of BART's Five Year Plan are the Gramm-Rudman-Hollings Act and BART Board approval of the 1985 Sales Tax Revenue Bond Issue. The proceeds from this issue are to be used primarily for parking improvements and park/ride projects.

PROGRAM FINANCIAL REQUIREMENTS

The first step in describing financial requirements is to update cash flow estimates for all projects contained in BART's program. Estimates of annual cash requirements (cash flows) are developed by the project's sponsoring department. The fund source information (fund splits) for funded projects is based on past grant actions. Generally, fund source projections for unfunded projects are based on BART's latest submission to the MTC Transportation Improvement Program (TIP) priority process. Project justifications for FY 86/87 submittals to the MTC Transportation Improvement Program priority process are shown in Appendix C.

BART's five-year funded and unfunded capital program is presented in Tables III-4 and III-5 beginning on pages III-12 and III-15, respectively. These tables list all capital projects, their estimated costs, and annual expenditure projections (cash flows). For these projects, the sum of the funded budget and the estimated unfunded portion equals the total project cost. Due to the uncertainty about funding for system extensions, estimated costs for this program are shown separately in Table III-11. Funded and unfunded cash flows by funding source are summarized in Tables III-6 and III-7 on pages III-19 and III-20, respectively.

PROJECTED SOURCES

The primary federal capital funding sources continue to be UMTA Section 3 and Section 9 funds. Section 3 funds come from a trust fund that was created from the 1982 "Gas Tax" legislation. This trust fund provides a dedicated funding source for the transit industry. The Section 9 program, for more routine capital items, is provided through formula grants to local jurisdictions and will cover 80% of a project's cost. BART's split of projects between Sections 3 and 9 is based upon the capital priorities process conducted by the Metropolitan Transportation Commission. Section 3 funds are being provided for 90 new transit vehicles as well as a share of the Daly City Project. The funds shown are as requested in recent negotiations with UMTA. They also reflect the Letter of Intent for the transit vehicles, and the Full Funding Agreement for the Daly City Project.

Recently it became apparent that significant savings, due to lower than expected inflation rates, would be realized in the new transit vehicle purchase. The plan reflects an estimated \$47 million reduction in the cost of this project. Of that savings, some \$25.6 million will accrue to BART with the remainder being returned to UMTA and the State. We are working with these agencies to use the savings for other BART projects to the extent possible. The BART savings have been programmed to cover additional purchase of extensions' right-of-way.

The Gramm-Rudman-Hollings Act was passed by Congress in December 1985. This legislation was enacted to produce a balanced budget by 1991. To achieve this, the new law requires reduced federal spending. An across-the-board cut of 4.3% in mass transit funding became effective March 1, 1986. The effect on BART's capital program is that some projects may not be funded. Across-the-board cuts for FY 86/87 may go as high as 20%.

Congress is also considering other changes to UMTA funding. The Reagan Administration has recommended changes in mass transit funding including elimination of the "Gas Tax" and elimination of Section 9 formula funds. In place of Section 9, it is proposed to combine highway and mass transit funds into a single block grant. A two-thirds cut in mass transit spending is recommended for FY 86/87. As a result of these cuts, BART for the first time is faced with the definite prospect of not receiving any formula funds in FY 86/87 beyond those programmed for the Daly City Turnback and Yard.

On the state level, the Transportation Planning and Development (TP&D) funds continue to decrease as a result of a reduction in gas usage and prices. In addition, substantial uncertainty must be attached to state guideway funding due to California's recent turn toward more emphasis on highway and a major transit project in Los Angeles. These developments make it less likely that BART will be able to obtain state funding for extensions.

State and Federal funding availability is based upon the results of the MTC capital priorities process. MTC allocated bridge tolls are assumed to be available to match UMTA Section 9 funds plus provide matching funds for extensions' right-of-way purchases.

Available BART capital reserves are also identified along with estimated interest earnings with interest calculated on an annual basis. In each year, funded cash flows are drawn down from the starting balance of each reserve source. The interest earned on the resulting balance accrues to that account. Simple interest is calculated at an 8% annual rate. BART reserves contribute a significant amount to the Daly City Turnback. In addition, reserves contribute part of the local match for 90 New Transit Vehicles.

The BART Board approved a new Sales Tax Revenue Bond Issue in November 1985. The proceeds from the new bond issue refund the 1982 Sales Tax Bonds (the proceeds of which are to be used for a portion of the new transit vehicle purchase). The balance will be used to fund parking improvement projects and park/ride facilities. BART had anticipated Section 9 funds to also support the parking projects, but that appears unlikely due to federal budget cuts and MTC programming.

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A final element in the capital financial picture is the linkage to the annual operating budget. This connection in the annual budget includes capital and other allocations for revenue bond debt service, improvement allowance, planning, and joint development.

CAPITAL FUNDING ADEQUACY

Given the funding assumptions discussed, a comparison with capital requirements is shown in Table III-8 on pages III-21 through III-23. The table shows the aggregate need and projected availability by source for each year in the current planning period.

Because of their magnitude and financial complexity, additional detail is provided in Tables III-9, III-10, and III-11, beginning on page III-24 for the Daly City Turnback and Yard, the New Transit Vehicles, and the BART Extensions.

It will be necessary to receive assistance from each level of government in order to fund the extension program. Since federal funds are in short supply, a strong commitment for state and local funding is important to demonstrate local support to federal decision makers. As seen in Table III-11, the BART Extensions are planned on the overall basis of approximately fifty percent federal funding, with the balance from state and local funds. Because of the projected limits for federal funds, some corridors utilize more local funding than previously projected.

The impact of this financial plan upon BART's capital reserves is shown in Table III-12 on page III-27.

CONCLUSION

It is difficult to predict what will be the final outcome of Gramm-Rudman. Programming of BART capital projects has been based upon the assumption that grant programs at the federal, state, and local levels will continue at approximately their current levels. Given this assumption, BART's capital program appears fundable with two important exceptions: Funding for system extensions is highly uncertain even with continuation of a federal program in this category due to intense competition from other metropolitan areas. Second, BART must seek other funding sources for its parking improvement projects. Reduction of the current federal program will endanger not only potential extension funding, but BART's current Capacity Expansion Program and routine capital replacement process.

Table III-4
BART FIVE-YEAR FUNDED CAPITAL PROGRAM (\$X1000)

CASH FLOWS										
FMS PROJECT NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	91/92	TOTAL	
GROUP: VEHICLE										
41E1	VEHICLE FIRE HARDENING	17000	3818	0	0	0	0	0	28818	
41G8	2ND GENERATN ATO/138 A-CAR SETS	0	0	5244	4756	0	0	0	10000	
42AA	150 2ND GEN TRANS VEH W/ PRO ATC	16734	53295	132575	11766	0	0	0	214372	
	SUBTOTAL	33734	57113	137819	16524	0	0	0	245190	
GROUP: FACILITIES - MAINLINE										
0-8A	EXTENSIONS R-O-W ACQUISITION	9500	29967	0	0	0	0	0	39467	
01G	PERM IMPV/CALTRANS LOT-FMS (111)	1677	677	0	0	0	0	0	2354	
02AC	FIRE MONT-SQ. BAY STUDY & A/A/EIS	91	120	0	0	0	0	0	331	
03FD	FIRE MAIN MODIFICATIONS (BHT)	289	50	0	0	0	0	0	339	
04AC	EIR & PREL ENGRG/ P-LINE PH I	88	683	0	0	0	0	0	771	
06AB	L-LINE EXTENSION PLANNING	136	317	0	0	0	0	0	453	
11--	DAILY CITY TURNBACK & YARD	55313	57157	37059	271	0	0	0	149800	
11TD	SHOP FACILITIES - ODY	0	790	1216	1050	0	0	0	3056	
12AC	ALTRN. ANALYSIS & EIR-SFO	107	423	0	0	0	0	0	530	
	SUBTOTAL	67201	90184	38395	1321	0	0	0	197101	
GROUP: FACILITIES - STATION & ACCESS										
0-6	PK/STATION IMPR (1942SP)	0	1838	2490	707	0	0	0	5035	
01G	100-SP ALAMEDA PKR/RD-FVS (111)	0	0	0	0	0	429	0	429	
01K	EMPLOYEE BREAK ROOM-HAS	0	42	0	0	0	0	0	42	
01W	300-SP PKG EXPAN-HAS	0	2204	0	174	196	0	0	2574	
02GA	PARK/RIDE LOT GRIMMER BLVD-WSS	0	2310	165	860	903	0	0	4073	
03JE	PERM IMPRV/CALTRANS LOT-LAS(1)	0	11130	165	174	0	0	0	11469	
03NE	1200-SP WESTLOT EXPANSN-PHS (1)	0	254	267	0	0	0	0	521	
03NG	1861-SP REPLACEMENT PKG-PHS (1)	1200	0	934	0	0	0	0	2134	
03NH	ACCESS & SEWER RELOC/ST DEV-PHS	0	0	3197	8103	8509	744	0	20553	
03PJ	AD*L ATC WORK SPACE @ TC RM-COY	5	40	0	0	0	282	0	282	
03SJ	475-SP WST CONC CORRELLLOT-CDS	0	0	254	274	0	0	0	45	
04DA	BUS STATION PARKRIDE LOT-NCM-XXR	171	937	0	0	0	0	0	528	
04TA	PK/RIDE LOT RAILROAD AVE-PHS	0	319	0	0	158	176	0	1006	
05A	PK/RIDE LOT RAILROAD AVE-PHS	0	969	0	0	0	0	0	969	
05BA	AD PKG FACILSVIRGINIA ST-NBS	0	544	0	0	0	0	0	544	
05KD	300-SP PKG EXP/VAIR-CNS (11)	0	1904	217	0	0	0	0	2121	
05MD	COMPLETE WEST END OF LOT (111)	0	0	0	0	0	0	0	0	
05NJ	AD*L ATC WRK SPACE @ TC RMS-RIV	14	57	0	0	0	0	0	71	
06KA	500-SP PK/RIDE LOT/1E11-HRS(XXR)	0	2100	0	0	669	782	0	3471	
06GA	1400-SP PK/RIDE LOT W/ BRDQ-DOB	0	7665	1599	1740	0	0	0	11004	
10AJ	1-680 -X-BUS ON-RAMP PAOS-SLRN	5	90	53	0	0	0	0	148	
11ED	100-SPACE PARKING EXPN-OWS (11)	0	89	0	0	0	0	0	89	
11EH	700-SP FRINGE PKG FACILITY-OWS	0	4000	0	0	0	0	0	4000	
11HH	RESTROOM ACCESS MODS-CDS	19	41	0	0	0	0	0	60	
11JF	PLAZA ENTRANCE FENCING 16TH & 24TH	1	15	0	0	0	0	0	15	
13AZ	WET STN/PIPES & PD CONNS-21 STA	12	800	406	0	0	0	0	1218	
14C	WET STN/PIPES & PD CONNS-21 STA	12	800	406	0	0	0	0	1218	
15C	ESCALATOR RENOV PROGRAM	100	91	0	0	0	0	0	141	
15NG	SELF OPERATN-ELEVATORS/HNDLCPD	1090	2242	2000	1168	0	0	0	6500	
17BR	1985 BPS OFC & SPACE MODS - LMA	304	936	0	0	0	0	0	2440	
1795	5TH FLOOR REFURBISHMENT/1986-LMA	10	158	0	0	0	0	0	168	
		0	102	0	0	0	0	0	102	

Table III-4 (continued)

BART FIVE-YEAR FUNDED CAPITAL PROGRAM (\$1000)

CASH FLOWS									
FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	W1 5	TOTAL
GROUP: FACILITIES-STATION & ACCESS									
17FD	BLDG MODS STRUCT/ELEC/MECH-STB	36	93	0	0	0	0	0	129
59DD	STA INFO CENTERS-AREAWIDE	28	0	0	0	0	0	0	28
994B	REVENUE BOND PKG CONTINGENCY	0	3465	0	405	439	0	0	4309
	SUBTOTAL	2999	44516	12607	13605	10874	2051	382	87034
GROUP: FACILITIES-SUPPORT									
17CG	PRKG LOT PAVING STOR AREA-OSA	5	50	0	0	0	0	0	55
794C	RAIL TRANSPORT BUGGIES	12	200	0	0	0	0	0	212
794E	TRACK GEOMETRIC ANALYSIS CAR	10	0	0	0	0	0	0	370
	SUBTOTAL	27	610	0	0	0	0	0	637
GROUP: TRAIN CONTROL									
20--	WAYSIDE TC & SYSTEM PEFOR MODS	664	5677	559	0	0	0	0	6900
20AC	ELIMINATE STATION INTERFACES	1961	139	139	0	0	0	0	2900
20AD	END-OF-LINE MAKES & BREAKS	41	170	0	0	0	0	0	211
20BF	TIMELOCKING MODS	51	384	0	0	0	0	0	435
20FD	OPTIMIZE SPEED PROFILES	138	351	0	0	0	0	0	489
21EB	ACI SYSTEM IMPROVEMENTS MAY	50	23	0	0	0	0	0	73
61--	INTEGRATED CONTROL SYSTEM - ICS	19670	8640	3391	158	0	0	0	31859
	SUBTOTAL	22575	15545	4089	158	0	0	0	42367
GROUP: AEC & COMMUNICATIONS									
27BB	COMMUNICATNS CABLE NETWORK-CCN	9867	2223	0	0	0	0	0	12090
27DB	RADCON	3186	549	0	0	0	0	0	3735
27DB	PLATFORM PA EXT-ABOVE GRD STAS	230	17	0	0	0	0	0	247
45AC	EXPAND AFC DAS CAPABILITY	0	115	0	0	0	0	0	115
45AH	AC/BART/MUNI SUPER PASS	350	61	0	0	0	0	0	411
45BP	ISM TICKET TRANSPORT RETROFIT	1700	1000	236	0	0	0	0	2936
45CB	"B" RETROFIT - CUBIC AFC	119	419	418	418	0	0	0	1675
	SUBTOTAL	15052	4453	655	418	0	0	0	21376
GROUP: ELECTRIFICATION									
03FK	2ND PHR TRANSFORMER/E-PORTL-BHT	169	90	0	0	0	0	0	259
09FE	RPLC PCB TRANSFORMERS & SF VENT	84	300	280	64	0	0	0	728
15EG	ELECTRICAL CAPACITY IMPROVEMENTS	583	0	0	0	0	0	0	583
15EK	PGEE RATE EVAL/ALT SOURCES	75	41	0	0	0	0	0	116
	SUBTOTAL	911	431	280	64	0	0	0	1686
GROUP: PROCUREMENTS									
15CL	RAIL REPLACEMENT PROG 1/11 (82/4	439	191	0	0	0	0	0	630
15CL	RAIL REPLACEMENT PROG 84/6 111/1V	0	399	363	0	0	0	0	762
15CL	RAIL REPL PH V (86/71)	0	346	0	0	0	0	0	346
79--	REPL MAINT EQ (82/4)	400	0	0	0	0	0	0	400
79AC	NEW VANS FY 85/86	27	0	0	0	0	0	0	27
79AD	NEW VANS FY 87/88	0	32	0	0	0	0	0	32
79AD	NEW PICKUPS FY 85/86	15	0	0	0	0	0	0	15
79AD	NEW PICKUPS FY 87/88	0	11	0	0	0	0	0	11
79B-	REPL OVERAGE SEDAN/MNT VEH (82/4	833	0	0	0	0	0	0	833
791V	VACUUMS & SCRUBBERS FY 85/86	10	0	0	0	0	0	0	10

Table III-4 (continued)
BART FIVE-YEAR FUNDED CAPITAL PROGRAM (\$X1000)

FMS NO.	PROJECT NAME	PRIOR YRS	CASH FLOWS							TOTAL	
			86/87	87/88	88/89	89/90	90/91	91/92			
GROUP 1 - PROCUREMENTS											
	SUBTOTAL	1724	949	395	0	0	0	0	0	3068	
GROUP 2 - OTHER COSTS											
114-	DAILY CITY INTERMODAL FACILITY	0	0	1300	0	0	0	0	0	1300	
9985	LAND AND LAND RIGHTS	0	121	0	0	0	0	0	0	121	
9985	AGENCY AND UTILITY AGREEMENTS	123	100	100	100	100	1000	0	0	1523	
9985	OTHER COSTS (INSURANCE, AGENTS, ETC.)	28	100	100	100	100	1442	0	0	1870	
9985	OUTSTANDING CLAIMS	0	0	0	0	0	3996	0	0	3996	
9985	PROJECT DEVELOPMENT	5500	4000	4000	4000	2500	0	0	0	20000	
9985	PLANNING AND SAID DEVELOPT.	1099	1405	1394	1431	1506	1587	0	0	8422	
9985	STATION DEVELOPMENT	0	1470	1867	1000	2664	2370	0	0	12571	
9985	STATION DEVELOPMENT	0	1000	1000	1800	1000	3500	0	0	5008	
9986	IMPROVEMENT ALLOWANCE	3000	3100	3200	3300	3400	3500	0	0	19500	
9987	C-CAR START-UP	0	2000	0	0	0	0	0	0	2000	
9987	SPS JUSTIFIED PROJECTS	0	0	10000	0	0	0	0	0	10000	
9987	DAILY CITY TURNBACK R E O* RUN	8000	0	0	0	0	0	0	0	8000	
	SUBTOTAL	17750	16496	22961	10931	11270	14895	0	0	94303	
GRAND TOTAL		162773	230297	217201	43021	22144	16946	382		692764	

BART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$x1000)

FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	91/92	TOTAL
GROUP: VEHICLE									
4103	2ND GENERATION ATO/138 A-CAR SETS								
	PROGRAM YEAR AMOUNT	0	0	3800	0	0	0	0	3800
	UNFUNDED CASH FLOW	0	0	0	3800	0	0	0	3800
4211	150 2ND GEN TRANS VEH W/ PRO ATC								
	PROGRAM YEAR AMOUNT	13926	0	0	0	0	0	0	13926
	UNFUNDED CASH FLOW	0	0	0	13926	0	0	0	13926
	SUBTOTAL PROGRAM YEAR AMOUNT	13926	0	3800	0	0	0	0	17726
	SUBTOTAL UNFUNDED CASH FLOW	0	0	0	17726	0	0	0	17726
GROUP: FACILITIES - MAINLINE									
0-8-	EXTENSIONS R.O.B. ACQUISITION								
	PROGRAM YEAR AMOUNT	0	46717	0	0	0	0	0	46717
	UNFUNDED CASH FLOW	0	2214	44503	0	0	0	0	46717
02AC	FRONT-LOADING STUDY & ANALYSIS								
	PROGRAM YEAR AMOUNT	0	1469	0	0	734	735	0	1469
	UNFUNDED CASH FLOW	0	0	0	0	734	735	0	1469
04AC	EIR & PREL ENG'G/ P-LINE PH I								
	PROGRAM YEAR AMOUNT	0	1529	0	0	0	0	0	1529
	UNFUNDED CASH FLOW	0	112	750	667	0	0	0	1529
08AB	L-LINE EXTENSION PLANNING								
	PROGRAM YEAR AMOUNT	1147	0	0	0	0	0	0	1147
	UNFUNDED CASH FLOW	0	574	573	0	0	0	0	1147
117D	SHOP FACILITIES - ODY								
	PROGRAM YEAR AMOUNT	4854	0	0	0	0	0	0	4854
	UNFUNDED CASH FLOW	0	1704	3150	0	0	0	0	4854
12AC	ALTERN. ANALYSIS & EIR-SFO								
	PROGRAM YEAR AMOUNT	0	1970	0	0	0	0	0	1970
	UNFUNDED CASH FLOW	0	773	1197	0	0	0	0	1970
9940	AERIAL BARRIERS PHASE I & II								
	PROGRAM YEAR AMOUNT	0	0	0	10738	0	0	0	10738
	UNFUNDED CASH FLOW	0	0	0	0	0	10738	0	10738
9941	SYSTEM SAFETY UPGRADE PH III REM								
	PROGRAM YEAR AMOUNT	0	5000	0	0	0	0	0	5000
	UNFUNDED CASH FLOW	0	56685	0	10738	0	0	0	5000
	SUBTOTAL PROGRAM YEAR AMOUNT	6001	3673	48727	8617	734	735	10738	73424
	SUBTOTAL UNFUNDED CASH FLOW	0	0	0	0	0	0	0	0
GROUP: FACILITY STATION & ACCESS									
01EE	435-SP PKG FACILITY-LMS(111)								
	PROGRAM YEAR AMOUNT	0	0	6485	0	0	0	0	6485
	UNFUNDED CASH FLOW	0	0	0	0	1276	3230	0	4506
01GH	550-SP FRINGE PKG FACILITY-FVS								
	PROGRAM YEAR AMOUNT	0	0	12639	0	0	0	0	12639
	UNFUNDED CASH FLOW	0	0	0	2130	5348	5361	0	12639
01MH	500-SP FRINGE PKG FACILITY-BFS								
	PROGRAM YEAR AMOUNT	0	0	10809	0	0	0	0	10809
	UNFUNDED CASH FLOW	0	0	0	4813	5996	0	0	10809
03HG	500-SP FRINGE PKG FACILITY								
	PROGRAM YEAR AMOUNT	0	0	9023	0	0	0	0	9023
	UNFUNDED CASH FLOW	0	0	0	0	2880	4544	0	7424

Table III-5 (continued)

BART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$x1000)

FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	TOTAL
GROUP: FACILITIES/STATION & ACCESS																													
03JG	700-SP FRINGE PKG FACILITY-LAS(1)		0	0	10654	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10654
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10654
03LG	1132-SP FRINGE PKG FAC-WCS (1)		0	16285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16285
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16285
03NE	1200-SP WESTLOT EXPANSN-PHS (1)		0	10738	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10738
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10738
03SH	1700-SP FRINGE PKG FACIL-CDS (1)		0	0	17779	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17779
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17779
04KA	PKA/IDE LOT/SOMERSVILLE RD-WAS		0	2476	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2476
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2476
05KM	500-SP FRINGE PKG FACIL-CNS		0	5970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5970
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5970
07GH	500-SP FRINGE PKG FACILITY-WAS		0	0	12140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12140
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12140
11EH	700-SP FRINGE PKG FACILITY-OWS		0	8181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8181
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8181
11FG	2 END STAIRWAYS-PLATF/MEZZ-EMS		0	1250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1250
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1250
154-	PH 1V SYSTEM ACCESSIBILITY IMPS		0	387	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	387
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	387
15NE	TEXTURED PLATFORM EDGE		0	420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	420
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	420
	PROGRAM YEAR AMOUNT		1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1300
	UNFUNDED CASH FLOW		525	775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1300
	SUBTOTAL PROGRAM YEAR AMOUNT		1300	775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1300
	SUBTOTAL UNFUNDED CASH FLOW		525	3480	2082	25462	46981	33789	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	112739
GROUP: FACILITIES/SUPPORT																													
01RM	EXPAND TRANSPORTATION BLOG-HAY		0	265	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	265
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	265
03PH	EXPAND TRANSPORTATION BLOG-COY		0	258	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	258
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	258
05NF	EXPAND TRANSPORTATION BLOG-RIY		0	318	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	318
	UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	318
	SUBTOTAL PROGRAM YEAR AMOUNT		0	841	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	841
	SUBTOTAL UNFUNDED CASH FLOW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	841

Table III-5 (continued)
BART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$x1000)

FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	91/92	TOTAL
GROUP: TRAIN CONTROL									
20--	WAYSIDE TC & SYSTEM REFOR MODS								
	PROGRAM YEAR AMOUNT	0	8029	0	0	0	0	0	8029
	UNFUNDED CASH FLOW	0	0	5040	2777	212	0	0	8029
21EB	ACL SYSTEM IMPROVEMENTS MAY								
	PROGRAM YEAR AMOUNT	0	246	0	0	0	0	0	246
	UNFUNDED CASH FLOW	0	246	0	0	0	0	0	246
	SUBTOTAL PROGRAM YEAR AMOUNT	0	8275	0	0	0	0	0	8275
	SUBTOTAL UNFUNDED CASH FLOW	0	246	5040	2777	212	0	0	8275
GROUP: ELECTRIFICATION									
15EG	ELECTRICAL CAPACITY IMPROVEMENTS								
	PROGRAM YEAR AMOUNT	7207	0	0	0	0	0	0	7207
	UNFUNDED CASH FLOW	26	3330	2350	1161	0	0	340	7207
20H8	ADDITIONAL STATION ESSENTIAL POWER								
	PROGRAM YEAR AMOUNT	0	2034	0	0	0	0	0	2034
	UNFUNDED CASH FLOW	0	300	1734	0	0	0	0	2034
	SUBTOTAL PROGRAM YEAR AMOUNT	7207	2034	0	0	0	0	0	9241
	SUBTOTAL UNFUNDED CASH FLOW	26	3630	4084	1161	0	0	340	9241
GROUP: PROCUREMENTS									
15CL	RAIL REPL PH V (86/77)								
	PROGRAM YEAR AMOUNT	0	91	0	0	0	0	0	91
	UNFUNDED CASH FLOW	0	91	0	0	0	0	0	91
15CM	2ND RAIL REPLCMT - PHS 1 87/8								
	PROGRAM YEAR AMOUNT	0	281	0	0	0	0	0	281
	UNFUNDED CASH FLOW	0	0	281	0	0	0	0	281
79--	REPL MAINT EQ 84/6								
	PROGRAM YEAR AMOUNT	400	0	0	0	0	0	0	400
	UNFUNDED CASH FLOW	200	200	0	0	0	0	0	400
79--	REPL MAINT EQ 86/8								
	PROGRAM YEAR AMOUNT	0	400	0	0	0	0	0	400
	UNFUNDED CASH FLOW	0	200	200	0	0	0	0	400
79--	REPL MAINT EQ 88/90								
	PROGRAM YEAR AMOUNT	0	400	0	0	0	0	0	400
	UNFUNDED CASH FLOW	0	0	200	0	0	0	0	400
79B-	REPL OVERAGE SEDAN/MNT VEH 84/86								
	PROGRAM YEAR AMOUNT	0	609	0	0	0	0	0	609
	UNFUNDED CASH FLOW	0	609	0	0	0	0	0	609
79B-	REPL OVERAGE SEDAN/MNT VEH (84/6								
	PROGRAM YEAR AMOUNT	0	2637	0	0	0	0	0	2637
	UNFUNDED CASH FLOW	0	0	2637	0	0	0	0	2637
79B-	REPL OVERAGE SEDAN/MNT VEH 86/88								
	PROGRAM YEAR AMOUNT	0	1096	0	0	0	0	0	1096
	UNFUNDED CASH FLOW	0	0	1096	0	0	0	0	1096
79B-	REPL OVERAGE SEDAN/MNT VEH (88/9								
	PROGRAM YEAR AMOUNT	0	0	370	0	0	0	0	370
	UNFUNDED CASH FLOW	0	0	0	370	0	0	0	370
790A	NEW HI-RAILERS - GEN FY 86/87								
	PROGRAM YEAR AMOUNT	0	232	0	0	0	0	0	232
	UNFUNDED CASH FLOW	0	232	0	0	0	0	0	232

Table III-5 (continued)
BART FIVE-YEAR UNFUNDED CAPITAL PROGRAM (\$x1000)

FMS NO.	PROJECT NAME	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	MI	S	TOTAL
GROUP: PROCUREMENTS										
792A	NEW HI-RAILERS - GEN FY 87/88									
	PROGRAM YEAR AMOUNT	0	75	0	0	0	0	0	0	75
	UNFUNDED CASH FLOW	0	0	75	0	0	0	0	0	75
	SUBTOTAL PROGRAM YEAR AMOUNT	400	5821	370	0	0	0	0	0	6591
	SUBTOTAL UNFUNDED CASH FLOW	200	1352	449	370	200	0	0	0	6591
GROUP: OTHER COSTS										
9988	REGIONAL ENERGY TRAINING PROG									
	PROGRAM YEAR AMOUNT	1250	0	0	0	0	0	0	0	1250
	UNFUNDED CASH FLOW	0	833	417	0	0	0	0	0	1250
	SUBTOTAL PROGRAM YEAR AMOUNT	1250	0	0	0	0	0	0	0	1250
	SUBTOTAL UNFUNDED CASH FLOW	0	833	417	0	0	0	0	0	1250
	GRAND TOTAL PROGRAM YEAR AMOUNT	30084	117693	84319	10738	0	0	0	0	242834
	GRAND TOTAL UNFUNDED CASH FLOW	751	13194	65680	56313	48127	34524	11498	230087	

Table III-6
BART FIVE-YEAR FUNDED CASH FLOW BY SOURCE (\$X1000)

FUND SOURCE	PRIOR YRS	86/87	FISCAL YEAR			90/91	91/92	TOTAL
			87/88	88/89	89/90			
FEDERAL FUNDS								
UNITA SEC 3 80% MONEY (UNITA3)	51910	38406	6907	110	0	0	0	97333
UNITA SEC 3 75% MONEY (UNITA3)	22189	31123	42726	0	0	0	0	96038
UNITA SEC 9 BLOCK GRANT (UNITA9)	16656	30479	23267	4076	0	0	0	74478
SUBTOTAL	90755	100008	72900	4186	0	0	0	267849
STATE FUNDS								
TPED/SB-G20 GUIDEWAY (GDWYT)	11229	17661	12380	22	0	0	0	41292
OTHER STATE (OTHER)	1164	262	0	0	0	0	0	1426
ART. XIX/PROPS GUIDEWAY (GDWYA)	6581	10045	1905	772	0	0	0	19303
SUBTOTAL	18974	27968	14285	794	0	0	0	62021
REGIONAL FUNDS								
TDA	2781	1158	236	0	0	0	0	4175
BRIDGE TOLLS (TOLLB)	4828	2850	5155	205	0	0	0	13038
STA	1799	1138	2054	0	0	0	0	4991
SUBTOTAL	9408	5146	7445	205	0	0	0	22204
BART FUNDS								
GENERAL CONSTRUCTION (OPERG)	6710	8026	11186	2187	3787	6326	100	38322
BASIC SYSTEM COMPLETION (OPGRB)	6103	4079	4062	4000	2500	0	0	20744
SYS. IMPROVEMENT RESERVE (OPGRS)	2577	603	164	0	0	0	0	3344
DLY CITY CONST. FUND ALL. (OPGRA)	0	0	2053	0	0	0	0	2053
VEH. FIRE HARDENING FND. (OPGRF)	2550	573	0	0	0	0	0	3123
INTEREST TRANSF. FUND (OPERT)	0	10258	0	4098	0	0	0	4098
ROW ACQUIS. AND EXT. PLN. (ROW/E)	3139	0	173	0	0	0	0	13570
IMPROVEMENT ALLOWANCE (OPERT)	4920	6735	5651	4866	3400	3500	0	29092
OPERATING & UNKNOWN FUNDS (OPERO)	873	231	0	0	0	0	282	1366
MULTI YR CAPITAL ALLOCNS (OPERM)	1388	3973	1637	1431	1506	1587	0	11422
REV. BOND CONST. FUND (OPERC)	15376	62797	93547	25332	10951	5533	0	213536
SUBTOTAL	43636	97175	122571	37836	22144	16946	382	340690
GRAND TOTAL	162773	230297	217201	43021	22144	16946	382	692764

Table III-7
BART FIVE-YEAR UNFUNDED CASH FLOW BY SOURCE (\$X1000)

FUND SOURCE	PRIOR YRS	86/87	87/88	88/89	89/90	90/91	91/92	TOTAL
FEDERAL FUNDS								
U.S. SEC. OF TREAS. MONEY (UNTAD)	0	3047	36490	19853	212	0	10738	70530
U.S. SEC. OF TREAS. MONEY (UNITA9)	601	7388	10003	5370	605	646	269	25082
FEDERAL AID INTERSTATE (FAI)	0	0	985	4607	4038	408	0	10738
SUBTOTAL	601	10435	47568	29830	5855	1054	11007	106350
STATE FUNDS								
ART. XIX/PROPS GUIDEWAY (GOWA)	4	527	3340	792	0	0	54	4717
SUBTOTAL	4	527	3340	792	0	0	54	4717
REGIONAL FUNDS								
BRIDGE TOLLS (TOLLB)	146	515	13409	272	40	0	13	14395
STA	0	122	0	0	0	0	0	122
SUBTOTAL	146	637	13409	272	40	0	13	14517
BART FUNDS								
IMPROVEMENT ALLOWANCE (OPERI)	0	232	0	0	0	0	0	232
OPERATING & UNKNOWN FUNDS (OPERO)	0	1363	1363	25419	42232	33470	424	104271
SUBTOTAL	0	1595	1363	25419	42232	33470	424	104503
GRAND TOTAL	751	13194	65680	56313	48127	34524	11498	230067

Table III-8
CAPITAL PROGRAM COMMITMENTS BASIS
FUNDING REQUIREMENTS VS. PROJECTED FUNDING

FUND SOURCE	PRIOR	86/87	87/88	88/89	89/90	90/91	
UNTA SEC 3 80% MONEY (UNTA3)							
PROJECTED	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0
UNTA SEC 3 75% MONEY (UNTA0)							
PROJECTED	38949	14198	1200	0	10738	0	65085
REQUIRED	28030	39762	0	10738	0	70530	0
DIFFERENCE	10919	-25564	1200	-10738	0	10738	-5445
UNTA SEC 9 BLOCK GRANT (UNTA9)							
PROJECTED	8089	12373	1452	4994	0	0	26908
REQUIRED	8089	13657	3336	0	0	0	25082
DIFFERENCE	0	-1284	-1884	4994	0	0	1826
UNTA SEC 5.6.9 PLAN.GRES.(UNTAH)							
PROJECTED	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0
FEDERAL AID URBAN (FAU)							
PROJECTED	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0
FEDERAL AID INTERSTATE (FAI)							
PROJECTED	0	10738	0	0	0	0	10738
REQUIRED	0	10738	0	0	0	0	10738
DIFFERENCE	0	0	0	0	0	0	0
SUBTOTAL FEDERAL FUNDS							
PROJECTED	47038	37309	2652	4994	0	10738	0
REQUIRED	28119	64157	3336	10738	0	0	106350
DIFFERENCE	18919	-26848	-684	-5744	0	10738	-3619
TPCD/SB-420 GUIDEWAY (GOVYT)							
PROJECTED	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0
OTHER STATE (OTHER)							
PROJECTED	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0
ART. XIX/PROPS GUIDEWAY (GOVYA)							
PROJECTED	0	1141	2968	608	0	0	4717
REQUIRED	1141	2968	608	0	0	0	4717
DIFFERENCE	-1141	-1827	2360	608	0	0	0
ART. XIX INTERMODAL (PSI)							
PROJECTED	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0
SB-1750							
PROJECTED	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0

Table III-8 (continued)
CAPITAL PROGRAM COMMITMENTS BASIS
FUNDING REQUIREMENTS VS. PROJECTED FUNDING

FUND SOURCE	PRIOR	86/87	87/88	88/89	89/90	90/91	WIS	TOTAL
SUBTOTAL STATE FUNDS								
PROJECTED	0	1141	2968	608	0	0	0	4717
REQUIRED	1141	2968	608	0	0	0	0	4717
DIFFERENCE	-1141	-1827	2360	608	0	0	0	0
TOA								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
BRIDGE TOLLS (TOLLB)								
PROJECTED	688	117	363	1249	0	0	0	2417
REQUIRED	625	13544	226	0	0	0	0	14395
DIFFERENCE	63	-13427	137	1249	0	0	0	-11978
STA								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	122	0	0	0	0	0	122
DIFFERENCE	0	-122	0	0	0	0	0	-122
SUBTOTAL REGIONAL FUNDS								
PROJECTED	688	117	363	1249	0	0	0	2417
REQUIRED	625	13666	226	0	0	0	0	14517
DIFFERENCE	63	-13549	137	1249	0	0	0	-12100
DALY CITY TRK O'RUN RES (OPERD)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
GENERAL CONSTRUCTION (OPERG)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
BASIC SYSTEM COMPLETION (OPERB)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
SYS. IMPROVEMENT RESERVE (OPERS)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
DLY CTY CONST. FUND ALL. (OPERA)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0
VEH. FIRE MAINTENING FND. (OPERF)								
PROJECTED	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0

Table III-8 (continued)
CAPITAL PROGRAM COMMITMENTS BASIS
FUNDING REQUIREMENTS VS. PROJECTED FUNDING

FUND SOURCE	PRIOR	86/87	87/88	88/89	89/90	90/91	W I	S	TOTAL
INTEREST TRANSF. FUND (OPERT)									
PROJECTED	0	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0	0
ROW ACQUIS. AND EXT. PLN. (ROW/E)									
PROJECTED	0	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0	0
IMPROVEMENT ALLOWANCE (OPERT)									
PROJECTED	3000	3100	3200	3300	3400	3500	0	0	19500
REQUIRED	0	232	0	0	0	0	0	0	232
DIFFERENCE	3000	2868	3200	3300	3400	3500	0	0	19268
OPERATING FUND (OPERA) UNKNOWN FUNDS(OPERO)									
PROJECTED	0	36670	0	0	0	0	0	0	0
REQUIRED	199	36670	80149	0	0	0	0	0	117018
DIFFERENCE	-199	-36670	-80149	0	0	0	0	0	-117018
MULTI YR CAPITAL ALLOCS (OPREH)									
PROJECTED	1099	1405	1394	1431	1506	1587	0	0	8422
REQUIRED	0	0	0	0	0	0	0	0	0
DIFFERENCE	1099	1405	1394	1431	1506	1587	0	0	8422
REV. BOND CONST. FUND (OPERC)									
PROJECTED	0	0	0	0	0	0	0	0	0
REQUIRED	0	0	0	0	0	0	0	0	0
DIFFERENCE	0	0	0	0	0	0	0	0	0
SUBTOTAL BART FUNDS									
PROJECTED	4099	4505	4594	4731	4906	5087	0	0	27922
REQUIRED	199	36902	80149	0	0	0	0	0	117250
DIFFERENCE	3900	-32397	-75555	4731	4906	5087	0	0	-89328
GRAND TOTAL									
PROJECTED	51825	43072	10577	11562	4906	15625	0	0	137787
REQUIRED	30064	117693	84319	10738	0	0	0	0	242834
DIFFERENCE	21741	-74621	-73742	644	4906	15625	0	0	-105047

Table III-9

DALY CITY TURNBACK/YARD FUNDING			
(\$000)			
<u>SOURCE</u>	<u>FUNDED</u>	<u>UNFUNDED</u>	<u>TOTAL</u>
UMTA 3 80%	7,900	-0-	7,900
UMTA 3 75%	44,038	-0-	44,038
UMTA 9 80%	60,193	-0-	60,193
STATE ABD RAIL R.O.W.	500	-0-	500
STATE ART XIX	10,100	-0-	10,100
STA	3,174	-0-	3,174
BRIDGE TOLL	4,193	-0-	4,193
BART/MTC*	<u>19,702</u>	<u>-0-</u>	<u>19,702</u>
TOTAL	149,800	-0-	149,800

* Funding to be provided by BART per Full Funding Grant Agreement if not available from MTC sources.

Table III-10

TRANSIT VEHICLE FUNDING 150-C-CARS (Excluding Preproduction ATC) (\$000)			
<u>SOURCE</u>	<u>FUNDED</u>	<u>UNFUNDED</u>	<u>TOTAL</u>
UMTA 3 80%	47,079	-0-	47,079
UMTA 3 75%	52,000	13,926	65,926
STATE TP&D	28,527	-0-	28,527
BRIDGE TOLLS	1,431	-0-	1,431
BART BOND/RESERVES	<u>85,335</u>	<u>-0-</u>	<u>85,335</u>
TOTAL	214,372	13,926	228,298

Table III-11

EXTENSION PROJECTS BY FUNDING SOURCE			
	(\$000)		
<u>PROJECT</u>	<u>FUNDING SOURCE</u>		
	<u>UMTA 3</u>	<u>STATE & LOCAL</u>	<u>TOTAL</u>
W. Pittsburg/North Concord	198,500	198,500	397,000
Irvington/Warm Springs	259,000	86,000	345,000
Castro Valley/Dublin	-0-	220,000	220,000
San Francisco Airport*	<u>338,700</u>	<u>338,700</u>	<u>677,400</u>
TOTAL	796,200	843,200	1,639,400

* Extension to San Francisco Airport is contingent upon an acceptable cost-sharing agreement. Local share is to be from San Mateo sources.

Table III-12

SUMMARY OF BART RESERVE CASH BALANCES

(Estimate in \$000's for 1991)

	<u>Line Item</u>	<u>Cumulative Total</u>
Cash Balances (Estimated for June 30, 1986)		250,254
- General Construction (Fund 01)*	28,675	
- Basic System Completion (Fund 01)*	9,928	
- System Improvement Reserve	5,584	
- Revenue Bond Construction Fund	178,468	
- Vehicle Fire Hardening Reserve	801	
- Interest Transfer Fund	5,736	
- DC Overrun Reserve/Full Funding Agmt.	8,511	
- DC Construction Fund Allocation	1,754	
- Multi-Year Capital Allocations	10,797	
Anticipated Interest		31,512
Capital Allocations from Operating Budget		7,323
Estimated Balance for Expenditures		289,089
BART Obligations, Local Shares, and Costs Unavailable from Grant Sources, and Net Project Costs		272,369
Contingency Funds (Balance)		
- DC Full Funding Grant Agreement		8,511
- General		8,209
Total		<u>16,720</u>

*Interest accrues to the Bond Fund and is available in the five year period; however, reserve balances do not change from year to year to reflect this since the interest does not actually accrue to the specific reserve.



ATTACHMENT

PUBLIC COMMENT



→ Htt (Ward) ~~lep~~
misc note! ~~1~~

5/12/86
5/13/86 ^m_s

MB



Oakland
Chamber of
Commerce

1939 Harrison Street
Oakland, CA 94612-3584
Telephone: 415/451-7800

May 8, 1986

Mr. Keith Bernard
General Manager
BART
P.O. Box 12688
Oakland, California
94604-2688

draft
acknowledgment
rec'd

Subject: Draft 1986 BART Five-Year Plan

Dear Mr. Bernard:

Our staff has completed the review of the Draft of the 1986 BART Five-Year Plan and has briefed the members of our Transportation Committee on the Plan.

We are basically in agreement with the Plan and particularly the policies dealing with the cooperative development of station areas, especially the stations located within the Oakland city limits. We do request that all reference to the Coliseum/Oakland Airport Station contain the full station name designation instead of just Coliseum Station as noted in the Draft.

Our Chamber continues to be vitally interested in the BART Extension Program and the commencement of delivery of the additional C Cars in 1987. We are confident that with the completion of the capacity expansion projects including the Daly City Turnback and with the new cars the transit needs of the Oakland Central Business District will be greatly improved in the foreseeable future.

Sincerely,

Bill

William S. Downing
President and CEO

WSD/pyw

cc: Robert H. Bisno, Chairman, Transportation Committee
David I. Wendel, Chairman of the Board, Oakland C of C
Margaret K. Pryor, Director, BART
John K. Christensen, Manager, Economic Development



BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (415) 464-6000

June 25, 1986

NELLO BIANCO
PRESIDENT

EUGENE GARFINKLE
VICE PRESIDENT

KEITH BERNARD
GENERAL MANAGER

Mr. William S. Downing
President and C.E.O.
Oakland Chamber of Commerce
1939 Harrison Street
Oakland, CA 94612-3584

DIRECTORS

Dear Mr. ^{Keith} Downing:

BARCLAY SIMPSON
1ST DISTRICT

NELLO BIANCO
2ND DISTRICT

ARTHUR J. SHARTSIS
3RD DISTRICT

MARGARET K. PRYOR
4TH DISTRICT

ROBERT S. ALLEN
5TH DISTRICT

JOHN GLENN
6TH DISTRICT

WILFRED T. USSERY
7TH DISTRICT

EUGENE GARFINKLE
8TH DISTRICT

JOHN H. KIRKWOOD
9TH DISTRICT

Thank you for your comments regarding BART's Draft 1986 Five Year Plan which I received in your letter of May 8, 1986. I was pleased to learn that the Oakland Chamber of Commerce is in general agreement with the plan.

In accordance with your request, references in the document to Coliseum/Oakland Airport Station have been revised to include the entire station name designation.

Sincerely,

Keith Bernard
General Manager

5/15/86



CITY OF HAYWARD. DEPT. OF PUBLIC WORKS

May 13, 1986

Keith Bernard, General Manager
Bay Area Rapid Transit District
P O Box 12688
Oakland, CA 94604-2688

Re: Draft 1986 BART Five-Year Plan

Dear Mr. Bernard:

The City of Hayward appreciates receiving a copy of BART's 1986 Five-Year Plan for our review.

As you are aware, the City is quite concerned about the parking situation at both the Hayward and South Hayward stations. We would like to encourage BART to augment the parking at these stations while preserving the landscaping and aesthetics. Additionally, we believe BART should actively proceed to develop the station sites to augment revenue for BART and to upgrade the areas around the stations.

Thank you for the opportunity to review and comment on your Five-Year Plan.

Very truly yours,


EDWARD E. PHILLIPS
Director of Public Works

cc: City Manager



BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (415) 464-6000

June 25, 1986

NELLO BIANCO
PRESIDENT

EUGENE GARFINKLE
VICE-PRESIDENT

KEITH BERNARD
GENERAL MANAGER

Mr. Edward E. Phillips
Director of Public Works
City of Hayward
22300 Foothill Boulevard
Hayward, CA 94541

DIRECTORS

Dear Mr. Phillips:

BARCLAY SIMPSON
1ST DISTRICT

NELLO BIANCO
2ND DISTRICT

ARTHUR J. SHARTSIS
3RD DISTRICT

MARGARET K. PRYOR
4TH DISTRICT

ROBERT S. ALLEN
5TH DISTRICT

JOHN GLENN
6TH DISTRICT

WILFRED T. USSERY
7TH DISTRICT

EUGENE GARFINKLE
8TH DISTRICT

JOHN H. KIRKWOOD
9TH DISTRICT

Thank you for your comments regarding BART's Draft 1986 Five Year Plan which I received in your letter of May 13, 1986. I have communicated your concerns with respect to parking expansion and joint development efforts at Hayward and South Hayward stations to my staff.

As you are aware, we are considering a parking lot redesign project for Hayward Station for the purpose of increasing the number of spaces at this facility. Every effort will be made to preserve the aesthetic amenities afforded by landscaping while also relieving some of the pressure for parking at this station.

With regard to your concern for development of station sites, BART Joint Development staff has had ongoing discussions with the City of Hayward regarding appropriate uses and densities for development of the Hayward Station area. A BART presentation to the Hayward Downtown Planning Committee is scheduled for June 12, 1986.

I view joint development as a very important element to the vitality of BART and the cities and counties it serves. I look forward to continuing to actively pursue the kind of development which will bring lasting benefits to Hayward as well as other cities in BART's service area.

Sincerely,

Keith Bernard
General Manager

BART FACTS
FY 1985/86 YEAR-TO-DATE DATA
(JULY 1985 - MAY 1986)

****FARES****

Regular Adult: Rail fares are largely based on a distance formula ranging from 80¢ to \$3.00. The average weekday rail fare is currently \$1.69. Regular express bus fares are 75¢ and \$1.15 for one and two zone rides, respectively; rail patrons transferring to an express bus may obtain a free transfer worth 75¢.

Discounts: A maximum 6.25% rail fare discount is provided through the sale of \$32 tickets for \$30. Rail fares for handicapped persons, students 5-12 years of age, and persons 65 years of age and older are 10% of the regular adult fares. Children under 5 can ride free. Discount bus fares are 15¢ for one zone and 30¢ for two zones for the groups listed above. A \$23 BART/MUNI monthly pass is also available, allowing for unlimited BART and San Francisco MUNI travel within San Francisco.

Transfers: Free transfers can be made between all BART trains. Special agreements between BART and most other Bay Area operators permit up to a 50% discount for connecting transit service (on a round-trip basis).

****PATRONAGE****

Average Weekday: BART patronage averaged 205,612 trips per weekday. Of these trips, 100,955 (49.1%) occurred within the 4-hour peak travel period (2 morning hours plus 2 afternoon hours). Transbay trips constitute 49.5% of weekday travel with 24.9% Eastbay and 25.6% Westbay.

Weekends: Saturday ridership averaged 85,625 trips with 46.4% Transbay, 29.9% Eastbay, and 23.7% Westbay. Ridership for Sunday averaged 47,275 with market shares of 46.8% Transbay, 32.4% Eastbay, and 20.8% Westbay.

Total Ridership: Rail ridership totaled 53,375,549 trips versus a forecast of 55,730,900 for the budget period July 1, 1985 through May 25, 1986 (4.2% below forecast).

****CAPACITY****

On-Line Requirements: BART currently operates a maximum of 43 on-line trains which require 86 A-cars and 235 B-cars. In addition to these, 8 trains are held as ready spares requiring 16 A-cars and 24 B-cars.

Maximum Service Delivery: As of May 1986, scheduled peak hour capacity for the three Transbay routes serving downtown San Francisco and Oakland stations is 16 trains consisting of 153 cars (or 11,016 seats). For the Eastbay route, which also serves downtown Oakland stations, maximum peak hour capacity is 5 trains consisting of 24 cars (or 1,728 seats).

****KEY PERFORMANCE INDICATORS****

Train On-Time Performance: Daily on-time performance has consistently been above 90% since October 1980 and averaged 92.4% for the first eleven months of FY 1985/86.

Scheduled Train Dispatches Completed: Performance has consistently been above 98% since January 1981 and averaged 98.7% during the July 1985 - May 1986 period.

Load Factors: Peak hour load factors for the first three quarters this fiscal year averaged 1.41 for Transbay service and 1.20 for the Eastbay route. Load factors for the shoulder period (approximately 45 minutes before and after the peak hour) averaged 1.23 Transbay and 1.06 for the Eastbay route. Maximum average load factors for offpeak service is 0.72 systemwide.

Peak Period Transbay Throughput: The year-to-date percentage of scheduled Transbay capacity actually provided for the period July 1985 through May 1986 is 97.3% for trains and 95.3% for cars.

****OTHER YEAR-TO-DATE BUDGET PERIOD DATA FOR FY 1985/86****

PERFORMANCE DATA (1,000's)	
Total Passengers	53,375.5
Passenger-miles	682,552.0
Car-miles	27,576.3
Car-hours	1,027.6
Rail operating cost	\$132,236.3
Express bus cost	\$6,915.0
Feeder/Shuttle bus cost	\$5,237.4
Total operating cost	\$144,388.7
Net passenger revenue	\$65,365.8
Other revenue	\$6,275.4
Total revenue	\$71,641.2
Operating deficit	\$72,747.5

PERFORMANCE INDICATORS	
Farebox ratio	45.27%
Operating ratio	49.62%
Passenger-miles/seat-mile	34.38%
Rail operating cost/passenger-mile	19.37¢
Rail operating cost/passenger	\$2.48
Total operating cost/passenger	\$2.71
Total operating revenue/passenger	\$1.34
Total operating deficit/passenger	\$1.36
Rail operating cost/car-hour	\$128.68
Rail operating cost/car-mile	\$4.80
Passenger-miles/car-hour	664.22
Passenger trips/car-mile	1.94





